

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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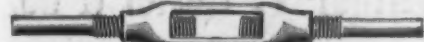
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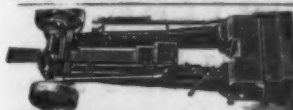


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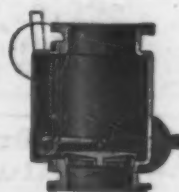
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THE IRON AGE

New York, Thursday, September 21, 1905.

A New Special Automatic Knife Grinder.

To grind the heaviest shear knives used in large rolling mills and iron works the Safety Emery Wheel Company, Springfield, Ohio, has designed, on entirely new lines, a heavy automatic knife grinder. Front and rear views of the machine are shown in the accompanying Figs. 1 and 2. It is stated to be the first machine made for this work with a legless bed resting directly on the floor. The effect is a greatly increased rigidity, particularly when the machine, as is generally the case, is set on concrete foundations. The base is 222 inches long

The emery wheel spindle is 3 inches in diameter and runs in bearings of a total length of 12 inches. The spindle pulley is 12 x 9 inches and is driven by a 24 x 24 inch pulley on a countershaft having 16 x 8 inch tight and loose pulleys. The emery ring wheel is 24 inches in diameter, 8 inches deep and has a 2-inch rim. It is held in a special chuck that withstands all of the centrifugal force, permitting the wheel to be run at a much higher speed than would otherwise be possible. For feeding the emery wheel to the knife bar there is a fine automatic feed.

This machine will grind all lengths of knives up to

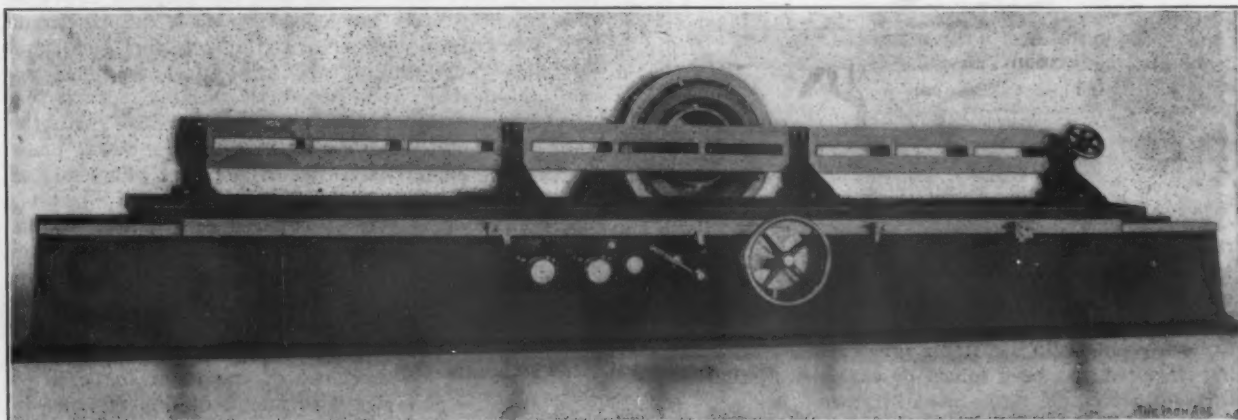


Fig. 1.—Front View of a New Grinder for Large Shear Knives, Built by the Safety Emery Wheel Company, Springfield, Ohio.

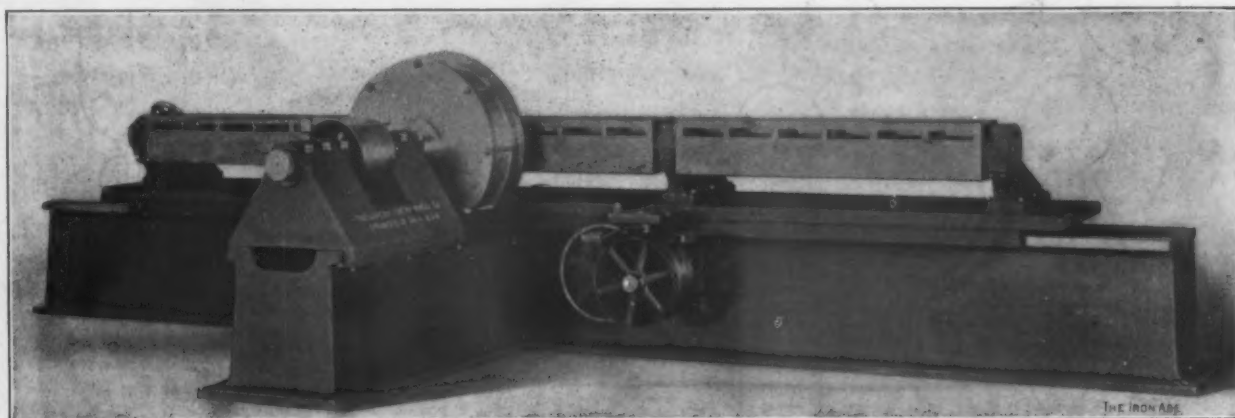


Fig. 2.—View from the Opposite Side of the New Automatic Shear Knife Grinder.

and unusually wide, the width being 25 inches. The carriage rests on broad flat ways, the front one being 4 inches wide and the rear one $4\frac{1}{2}$ inches. There are $1\frac{3}{4}$ -inch gibs on the back side to take up wear. The height from the floor to the top of the carriage is $25\frac{1}{4}$ inches and to the center of the emery wheel spindle $34\frac{1}{4}$ inches.

As a further preventive of vibration to allow very accurate grinding a heavy, well supported knife bar is provided. It is 8 inches square and has four bearings on the carriage, each 5 inches in diameter by 4 inches long. This square knife bar permits a knife to be surfaced on the side as well as to be ground. The knife bar is slotted for two sizes of bolts, $1\frac{1}{4}$ inches on one side and 2 inches on the other. The carriage is back geared 16 to 1, all racks and gears being 3 inches wide, of 5 pitch and cut from the solid. The carriage is driven by 14-inch pulleys from a countershaft, with a 12 x 8 inch driving pulley and 10 x 4 inch tight and loose pulleys.

160 inches. It weighs 13,445 pounds and occupies a floor space over all when grinding 160-inch knives of 320 x 76 inches.

An economizer installation of decided novelty is now being made for the American Steel & Wire Company's Consolidated Works, at Cleveland, Ohio, by the B. F. Sturtevant Company, Boston, Mass. The equipment, which will have a capacity of 5000 horse-power, is to be used in connection with billet heating furnaces, being the first installation of its kind ever made in America. The Sturtevant economizer was selected because of its metal to metal joints, which make it capable of withstanding high gas temperatures that would be destructive to gasket joints. The staggered arrangement of the tubes in this economizer is also of advantage, as it breaks up the volume of the gases and compels the particles to come in close contact with the entire heating surface.

Modern Turbine Pumps.*

The recent development of turbine pumps is due principally to the electric motor, which, on account of its high speed, is not well suited for operating reciprocating machinery. Although the rotary pump is not as efficient as the older kind, in combination with a motor it has so many advantages, such as compactness, simplicity and

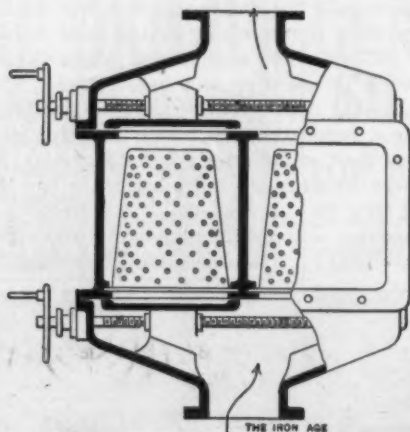


Fig. 1.—The Merrill Strainer.

regularity of output and pressure, that its use is rapidly increasing. In the past this type of pump has been extensively used when it was necessary to raise large quantities of water a small distance—10 to 15 feet. The modern problem, to use it for greater heights by increasing its speed, has been solved by experience gained with turbines, which led to the use of diffusion vanes.

The chief peculiarity in the operation of the rotary as compared with the piston pump is that with decreasing speed the delivery is proportionately less only against a

ment of several wheels in parallel which can be put in or out of service as required. This method is clumsy and unless the wheels that are not needed are motionless is uneconomical. The second and better way is to use a single pump, varying the delivery by changing the head by a throttle in the pressure line and designing the pump so that with a normal delivery the pressure is only slightly increased thereby. When the throttle is opened the amount delivered by the pump increases and *vice versa*. This of course affects the efficiency, but not seriously, as experience has shown, even when handling widely varying quantities of liquid. It is more difficult to insure an even flow with constant speed and varying height. This can only be done by arranging several wheels in series and cutting out those not required for the lower pressures.

The Efficiency of Turbine Pumps

is, in the first place, dependent on the experience, skill and care of the designer, particularly in the choice of the angles of entry and delivery and the shape of impellers and vanes. Second, much depends upon the exactitude with which the design is carried out, as very small and seemingly unimportant variations affect the efficiency in a high degree. It is impossible to build efficient turbine pumps cheaply. The efficiency increases with the horse-power of the pump. With a 5 horse-power pump 60 per cent. and with a 100 horse-power pump 80 per cent. have already been reached, and it is very possible that with units of several hundred horse-power an efficiency of 85 per cent. may be attained. These figures are based on the total height lifted, which in most cases has been increased somewhat by throttling and should be cut down from 2 to 5 per cent. when making comparisons with piston pumps.

The correct measurement of the height to be lifted is an absolute necessity with pumps of this type, as an error in estimating the hydraulic resistance might easily make the whole plant useless. For instance, with constant speed the water might be lifted very close to the

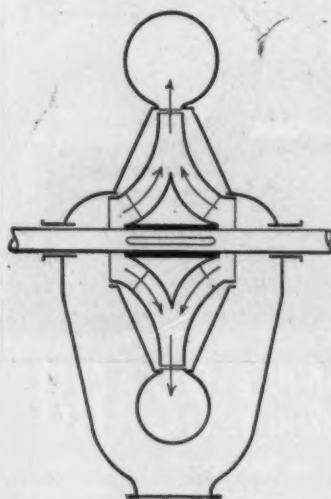


Fig. 2.—Ordinary Centrifugal Pump of Older Type with Double Suction.

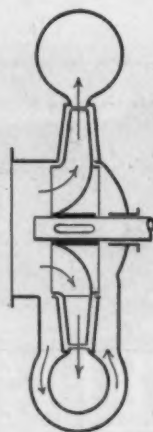


Fig. 3.—Centrifugal Pump with Single Suction.

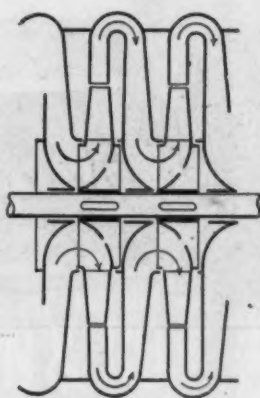


Fig. 4.—Scheme of Turbine Pumps of Worthington and Jaeger.

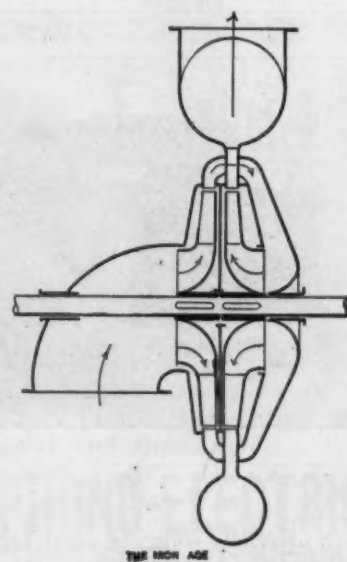


Fig. 5.—Scheme of High Pressure Centrifugal Pump of Sulzer.

head diminished as the square root of the speed. This makes this pump particularly suitable for oil lines or other service where the only resistance is the friction in the pipe, which varies in the same proportion. In most cases an even speed is one of the conditions.

If, as is often the case, it is required to deliver an unvarying amount of liquid to a constant height the rotary, or turbine, pump, as it is called, when fitted with vanes, can be used. If, however, the amount to be delivered varies, two ways are open. One is an arrange-

intended height without flowing, and also in course of time the efficiency will diminish because of leaks and wear and tear. The choice of speed is a matter of considerable importance. For example, a pump designed for 35 cubic feet a minute against a 328-foot head will give higher efficiency when constructed for 2000 than for 1000 revolutions per minute, as, in the first case, the water passages will be considerably shorter and the machine will offer less friction to the fluid. Finally, as might be expected, the efficiency increases with the number of stages in one housing. This is partly due to the relatively decreased friction in the stuffing boxes and

* Translation of an article by Otto H. Mueller in *Zeitschrift des Vereines Deutscher Ingenieure*.

partly, as experience has proved, to the fact that the impeller on the suction side is less efficient than those under pressure, so that the greater the number of the latter the less apparent will be the influence of the former.

Requirements in Their Design.

Practical points which demand consideration in building turbine pumps are in general the same as in other kinds. Particular stress must be laid on accessibility for removing foreign bodies, for cleaning and for replacing worn parts. An effort to construct any pump which will not be injured by foreign substances is useless, as the valves will necessarily suffer when anything comes between them and their seats. The most that can be done is to so design the parts that fracture will not occur and to subdivide the valves so that displacement

must be passed. In turbine pumps to clear the end wheels of foreign substance the whole pump must be taken to pieces; therefore it is of great importance that the pump be easily taken apart and put together. Pumps in which impellers, vanes and other parts are in a closed housing, into which they are pushed from one end, are at a disadvantage in this respect. The parts soon rust tight, making it difficult to get them out. The better construction is that in which the housing is divided into rings which are screwed together concentrically. Only single stage centrifugal pumps without vanes for handling large quantities of water against a low head are capable of passing foreign substances, and even they are liable to injury to the ends of the blades.

The trouble from sand in turbine pumps has been greatly exaggerated. It is just as harmful as in piston

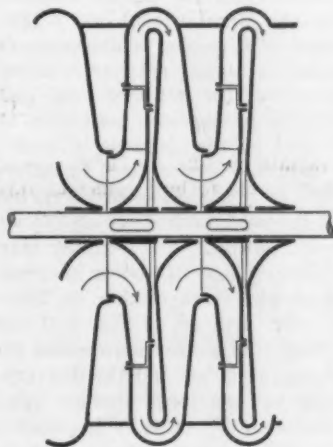


Fig. 6.—Scheme of Rateau Pump.

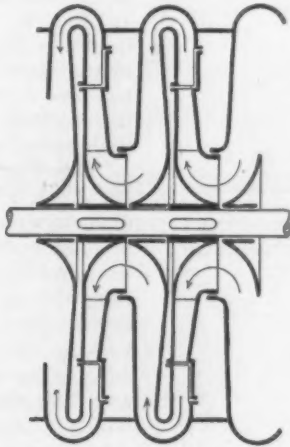


Fig. 7.—Scheme of Lang Pump.

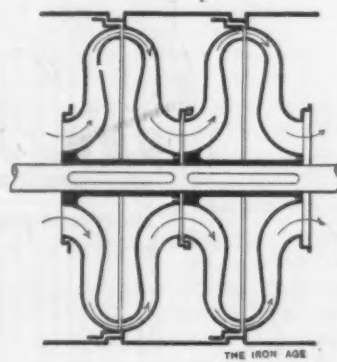
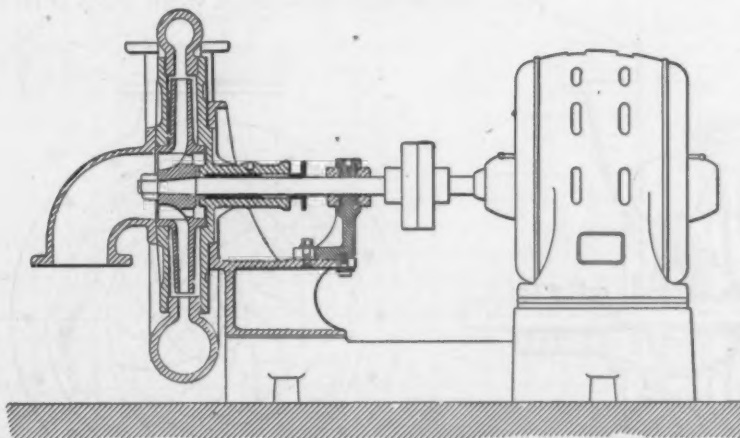


Fig. 8.—Scheme of Kugel-Gelpcke Pump.



Figs. 9 and 10.—Worthington Volute Pump.

of only a small part of them is probable. The correct and only sure way is to keep the foreign substance away, and the usual arrangement of one or more strainers has in practice proved very effective. Every such strainer under water will in time become choked and diminish the output of the pump. It is much better to place the strainer above the surface of the water instead of below it, as by stopping the pump it can then be removed and replaced by another very quickly. It is better still, but more complicated, to arrange two strainers in the suction line, either of which can be removed without stopping. A practical arrangement of this kind is Merrill's strainer, shown in Fig. 1.

The trouble with foreign substances is greater with turbines than with piston pumps, for with the sizes usually built, 8 to 10 inches diameter, with opening 0.3 to 0.4 inch wide, the chance of stoppage is greater than in ordinary pump valves. In the piston pump the foreign body has only to go through two valves, whereas in the turbine pump as many as 12 and even more impellers

pumps, attacking principally the interior packing and the stuffing boxes, which must be changed very frequently, but the impellers and vanes are seldom injured. This is because a well constructed pump is not liable to shocks, and where these do not occur sand in the water is incapable of doing damage. Hard water, such as is common in mines, forms a coating on the inner surface of the pump, which by diminishing the area lessens the efficiency.

Turbine Pump Operation.

The points to be observed in starting a pump and keeping it in operation are very simple. Above all, the pump should never run dry, as that leads in a very short time to heating up and destruction of the packings, and in some circumstances also to melting the bearings, bending the shaft and destroying the parting walls. Every pump must be provided with a funnel to fill it when starting, a foot valve in the suction line, air valves in each chamber and drain cocks to prevent injury by frost. In

the pressure line there must be a nonreturn, or shut off valve, and preferably both. When starting the pressure valve must be closed and not opened until the pump has attained full speed and pressure. With direct current motors the pump can start with the valve partly opened. Safety valves are unnecessary, as with a constant speed a certain pressure cannot be exceeded. This renders starting the pump simple and safe and is one of its greatest practical advantages over piston pumps. When running all that is necessary is to insure constant lubrication of shaft bearings and stuffing boxes.

Comparison of Existing Pumps.

Modern turbine pumps are almost exclusively radial pumps without any great difference in the method of

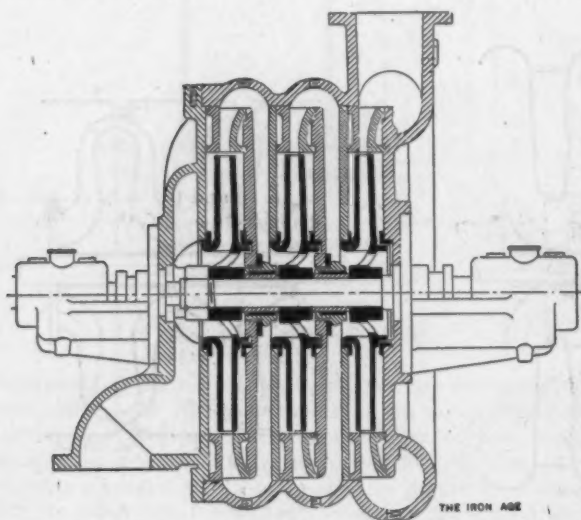


Fig. 11.—Older Type of Worthington Turbine Pump.

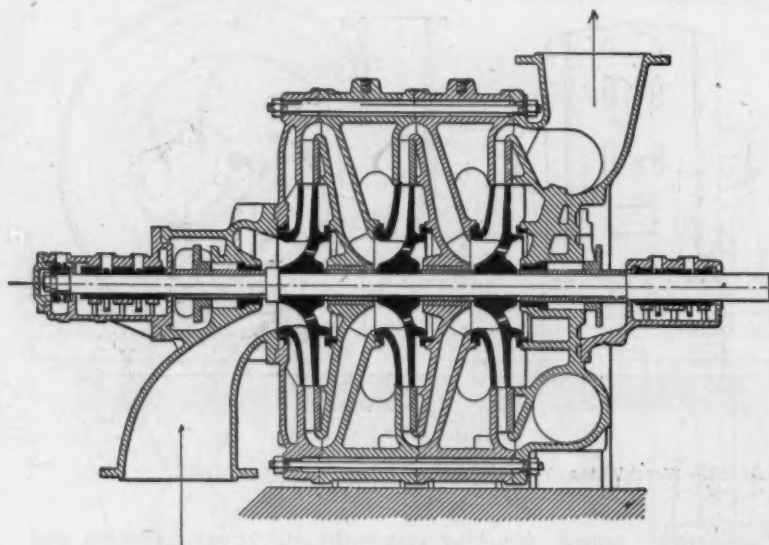


Fig. 12.—Jaeger Turbine Pump.

producing the speed. The chief differences are in the way by which end thrust is taken up. Figs. 2 to 8 show how this arises and how it is overcome. Fig. 2 shows the common centrifugal pump of the older type with double suction. As the whole construction is symmetrical end thrust cannot occur, but for multistage arrangement this form is practically useless. Fig. 3 shows a pump with suction on one side only, and on the other a chamber provided with packing rings and connected with the suction pipe. When both packings are of the same diameter the suction cannot cause end thrust, but a lateral pressure is formed by the diversion of the fluid. It is possible to balance the latter by making the packing rings of unequal diameter, but even then this form is unsuitable for building in series. The equalizing passage in Fig. 3 may be replaced by openings in the im-

peller between the shaft and the rear packing, and in the simplest manner possible the pump becomes suitable for arrangement in series. This is done in the Worthington and Jaeger turbine pumps (Fig. 4).

One sided impellers may also be used for multistage work if half of them are opposed in the direction of end thrust, the other half working in stages of equal pressure. The same result is attained if the wheels, keyed on right and left, are allowed to work together in pairs, as in Sulzer's high pressure pump, Fig. 5. Another method, shown in Fig. 6, is Rateau's arrangement, in which the impellers are all one sided and all coupled in the same direction, but with the walls of each wheel made of unequal diameter, those toward the suction side being the greatest. Somewhat similar is Lang's construction, Fig. 7, in which the impeller blades end with the smaller diameter, so that the overhanging edge of the larger disk acts as the boundary of the diffusion vanes. In Fig. 8, which shows the arrangement of Kugel-Gelpcke's pump, the pressure of diversion which appears at the entry to each impeller is almost entirely counterbalanced by back pressure from the delivery pipe, and the pressure of the water in the passages on both sides of each wheel is counterbalanced by the increase in area.

The counterbalancing, shown in Figs. 6 to 8, by different areas, is not to be seen at a glance, as the varying diameters cause pressures, the variation of which cannot be judged off hand. However carefully the designer may have provided against end thrust some will occur in operation, because the internal packings can neither be made nor kept absolutely tight. For instance, in Fig. 4, if one packing ring leaks more than another extra pressure results in the chamber between the latter and the delivery, and however slight it may be the large surface upon which it acts makes it important. As it is impossible to foresee which packings will become leaky, a certain end thrust, the amount and direction of which cannot be foretold, will occur and can best be provided against by suitable bearings.

Figs. 9 and 10 show the so-called volute pump of H. R.

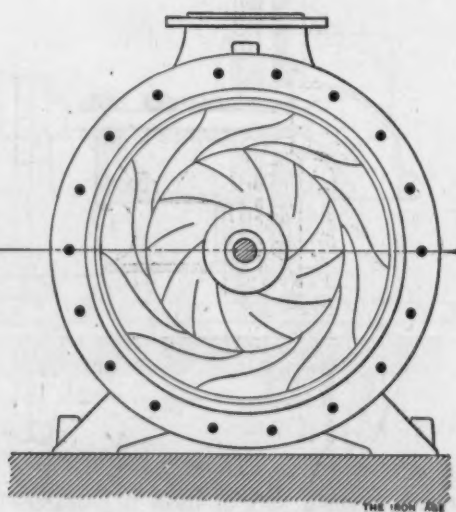


Fig. 13.—Jaeger Turbine Pump.

Worthington, an ordinary centrifugal pump, which instead of vanes has a passage between the discharge slots in the impeller and the spiral pressure pipe. This passage assists so materially in transforming speed into pressure that these pumps, which are only made single acting and for lifts up to about 50 feet, have an efficiency of 70 per cent. The rotary member was at first provided externally with radial ribs intended to keep the liquid on each side in motion, thus lessening the difference in pressure at the packing and consequent leaks. This object was attained, but at the cost of such greatly increased friction that the ribs were removed. Fig. 11 shows a Worthington turbine pump of older construction which differs from more modern machines chiefly in the housing, this being cast in one piece, and in the crowded arrangement of the wheels. Figs. 12, 13 and 14 show

turbine pumps built by C. H. Jaeger & Co. of Leipzig. The impellers and vanes are constructed of bronze and the shafts of nickel steel. For medium pressures the housing rings are bolted together by flanges, as shown in Fig. 14, while for higher pressures long bolts, as shown in Fig. 12, are used.

Tests of Turbine Pumps.

Figs. 15 to 18 show results of tests on turbine pumps. The abscissae represent the flow per minute, expressed in percentage of the pump's capacity. The upper curves show the lift obtained by throttling, the lower the efficiency when working against that lift. Fig. 15 represents

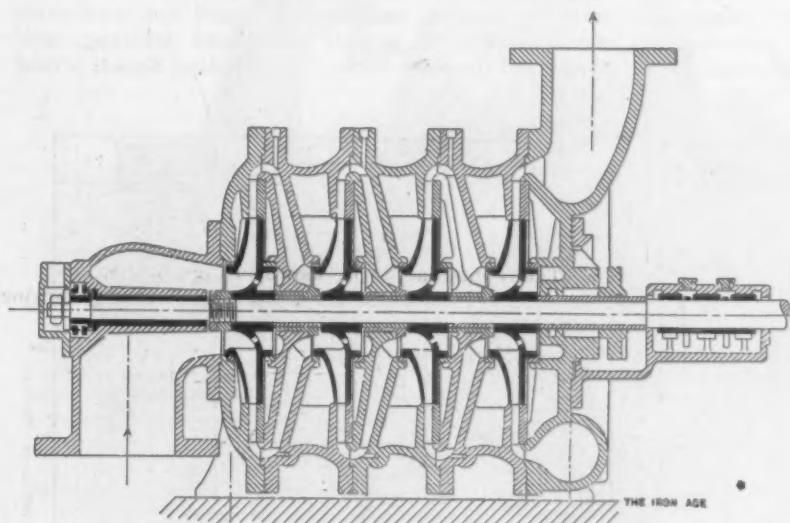


Fig. 14.—Jaeger Turbine Pump.

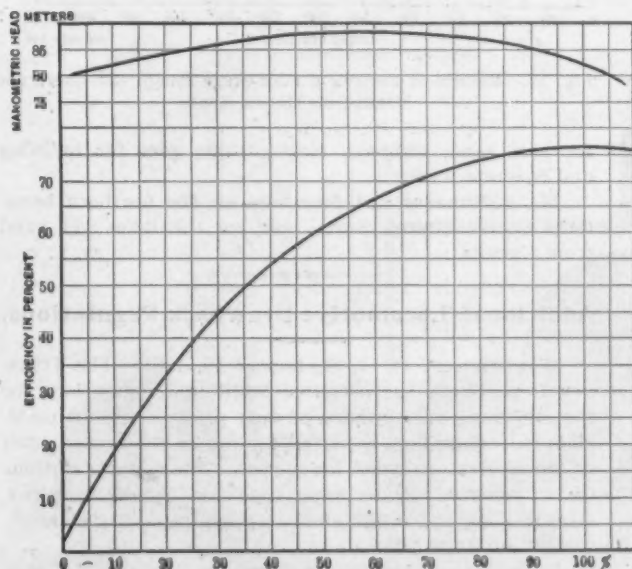


Fig. 15.—Results of Tests of a Four-Stage Pump, 1000 Liters per Minute, 80 Meters Head.

experiments on a pump of 1000 liters (264 gallons) a minute capacity against a head of 80 meters (262 feet) at 15,000 revolutions per minute. The maximum efficiency, 77 per cent., was obtained when pumping the rated capacity. Fig. 17 was obtained from a two-stage pump in Berlin, the rated capacity being 3500 liters (925 gallons) per minute against 140 to 145 feet head at 870 to 890 revolutions per minute. In this case also the highest efficiency obtained was when running at the rated capacity, and amounted to 78 per cent. Fig. 16 is from a six-stage pump of 2000 liters (528 gallons) capacity against 360 feet head at 1470 revolutions per minute. The highest efficiency, 79 per cent., was obtained with a delivery of 1700 liters (450 gallons) per minute and was only 77 per cent. at the rated capacity. Fig. 18 shows the results obtained with a comparatively small four-stage pump intended for 420 liters (110 gallons) per

minute against 207 feet head at 1430 revolutions per minute. The highest efficiency, 73 per cent., was in this case reached at 360 liters (95 gallons), and with any output between 280 and 440 liters the efficiency was over 70 per cent. In this figure a curve showing the amount of power used is also drawn, which indicates that with closed throttle—that is, with no flow—the power required was 40 per cent. of that at the rated delivery. This value is generally between 30 and 40 per cent., which is not unfavorable when only quite short intermissions are in question. In all the tests the pump, having been primed, was brought up to full speed with closed throttle;

the latter was then opened until the rated flow was reached. The overload was then given, upon which the throttle was gradually completely closed and finally opened again to yield the rated flow. The attainment of this point the second time invariably showed a higher efficiency, as in the elapsed 15 or 20 minutes the packings had worn smoother. The most striking feature about these tests is the comparatively flat course of the pressure curve and the easy course of the efficiency lines in the neighborhood of the normal capacity. This is attained by suitable form of blades.

The Utility of the Turbine Pump.

Although the advantages of pumps of this class have, as is usual with novelties, been greatly exaggerated, there is no doubt that an extensive field is open to them, particularly where electric transmission can be used to full advantage. Owing to the many defects of direct acting pumps the turbine pump will probably be

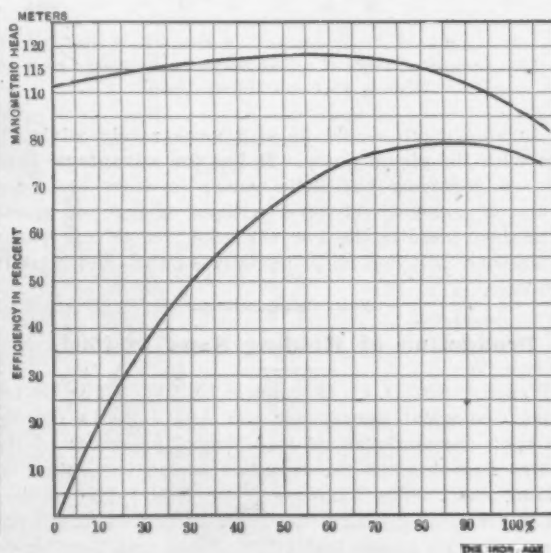


Fig. 16.—Results of Tests of a Six-Stage Pump, 2000 Liters per Minute, 110 Meters Head.

used for hydraulic purposes, for which their even pressure and their characteristic of stopping as soon as a certain maximum pressure is reached, with simultaneous decrease in consumption of power, make them particularly well suited. Practically any pressure can be obtained. Thus with 20 stages, which could readily be accommodated in two housings, at a speed of 3000 revolutions per minute, 3000 pounds per square inch could be obtained were such a pressure needed. As a matter of fact, Worthington turbine pumps have been used for operating hydraulic elevators in many of our large cities. On the other hand, where the use of steam cannot be avoided efficiency and adaptability speak for the piston pump.

At first sight the combination of the steam turbine and the turbine pump seems eminently appropriate. De Laval coupled a turbine pump directly to the shaft of his turbine, which ran at 20,000 revolutions per minute, whereby

the wheel diameter was considerably smaller than that required for suction and discharge pipes, and Rateau attached a single acting pump of 0.315 inch wheel diameter to his turbine with a speed of 9000 to 18,000 revolutions per minute. The delivery amounted to 400 to 420 liters per minute against 230 to 980 feet head, and the machine of course had to receive its water under pressure. In general it will be found that the speed of the steam turbine is such that it must either receive water under pressure or be divided into units working in parallel. The former case seldom occurs and the latter is not economical. Moreover, at its present stage of development the steam turbine in such small units as required for pumping purposes has not high enough efficiency to compensate in the least for the decreased efficiency of turbine pumps as against piston pumps.

For internal combustion engines a combination with

15 cents per ton or pay a fixed sum for all the sand in a stated mine or pit. Sometimes the owner of the sand markets it himself, but most of it is sold through dealers. The value of the sand free on board at point of shipment ranges from 35 cents to \$2 or \$3 per ton, the cheapest sand being used for rough casting and small cores and the highest priced sand for fine brass and bronze castings, the average price, however, being from 50 to 75 cents per short ton.

Some years ago the sand from New York, in Albany County and the Hudson River Valley, was one of the chief sands used in the Middle West, but these have lately been succeeded by local sands. In Pennsylvania and especially in Ohio sandstone ground into sand is used for molding, especially for steel and core sand. Some beach sand, notably from Lake Michigan, New Jersey and the south shore of Long Island Sound, is used

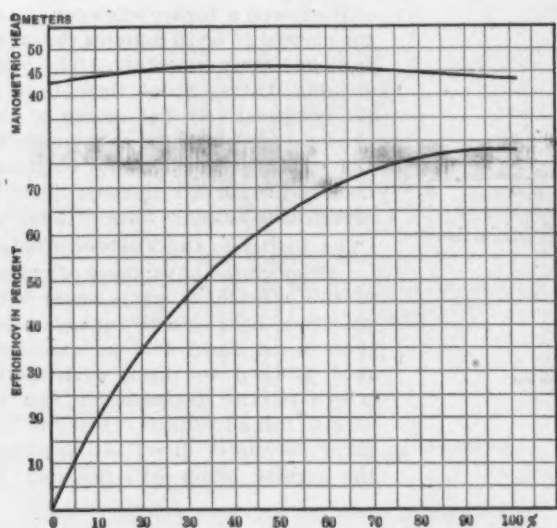


Fig. 17.—Results of Tests of a Two-Stage Pump, 3500 Liters per Minute, 43 to 45 Meters Head.

the turbine pump would be still more rarely advisable than with the piston pump. It has the advantage, however, of requiring but little power to start and easy change of amount delivered without change of speed. As against these is the low efficiency, for which reason the decision will depend principally on the conditions in each case.

Production of Molding Sand in 1904.

WASHINGTON, D. C., September 19, 1905.—The United States Geological Survey for the first time in connection with the statistics of the mineral resources of the country has obtained the figures showing the output of molding sand. The figures are for 1904. The production is given as 3,439,214 net tons, valued at \$2,125,370. The production is credited to 28 States and Territories, those producing over 100,000 tons being as follows: Pennsylvania, 628,064 tons; Illinois, 574,488 tons; Ohio, 484,090 tons; Kentucky, 386,330 tons; New York, 320,825 tons; Indiana, 170,145 tons; Michigan, 167,147 tons.

The value of the sand varies somewhat according to purity, amount of work necessary to prepare for use, the distance from point of shipment or consumption, use to which it is put, &c. The values given are as nearly as possible those obtained for sand ready for use free on board at point of shipment. In the case of many small foundries or where sand of no particular quality is desired for rough casting the sand is often obtained close to the foundry of quality sufficient to answer all purposes, there being no value for the sand other than the expense incurred in loading and hauling it to the foundry.

Generally molding sand occurs in more or less thin beds overlaid by thin soil, which is easily stripped and the material easily mined. In many instances dealers take out the sand and either pay a royalty of from 6 to

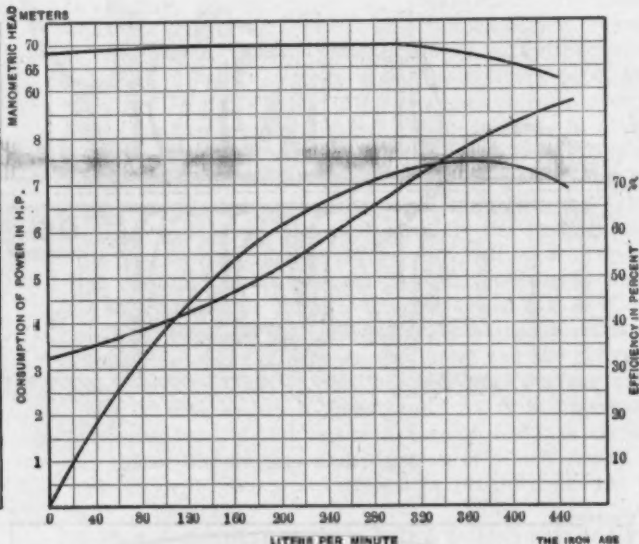


Fig. 18.—Results of Tests of a Four-Stage Pump, 420 Liters per Minute, 63 Meters Head.

for core sand, although most of this goes for building and concrete work.

Many furnaces and foundries on the northern boundary of the United States and on the lakes get sand from Canada.

W. L. C.

Additional Locomotive Drawback Regulations.

WASHINGTON, D. C., September 19, 1905.—The Treasury Department has prepared additional regulations for the allowance of drawback of duty paid on various materials and appliances imported for use in the construction of locomotives designed for export. The new regulations cover imported copper pipe used for equalizing pipes, steel springs and rough steel forgings used in the manufacture of wrist pins.

In the case of imported copper pipe it is provided that in liquidation the quantity which may be taken as the basis for allowance of drawback may equal the quantity consumed, as declared in the drawback entry, after official verification. In the case of the imported steel springs the allowance of drawback may be based in liquidation upon the actual number of springs used in the exported locomotive after official verification. In liquidating the drawback entries of wrist pins the regulations provide that the quantity of imported material in the shape of rough steel forgings which may be taken as the basis for the allowance of drawback may equal the quantity declared in the drawback entry after official verification of exported quantities, provided in no case it shall exceed 115 pounds for each wrist pin. It is understood that this limited weight embraces an adequate allowance for unrecoverable waste.

W. L. C.

It is announced that the Reading and Jersey Central railroads will purchase 6000 freight cars.

A New High Speed Cutting Off Saw.

For removing gates from steel castings the Railway Appliances Company, Chicago, has designed the high speed arbor driven cutting off saw herewith illustrated.

high carbon steels. The saw blade has a travel of 16 inches and a feed variable from $\frac{1}{4}$ to 1 inch per minute. An automatic friction feed is used and the rate of feeding may be changed instantly without stopping the machine. With the driving shaft running at 200 revolutions per minute the saw blade has a peripheral speed of 55 feet per minute and this speed can be increased or decreased according to requirements.

The V-block clamping device is designed to use either

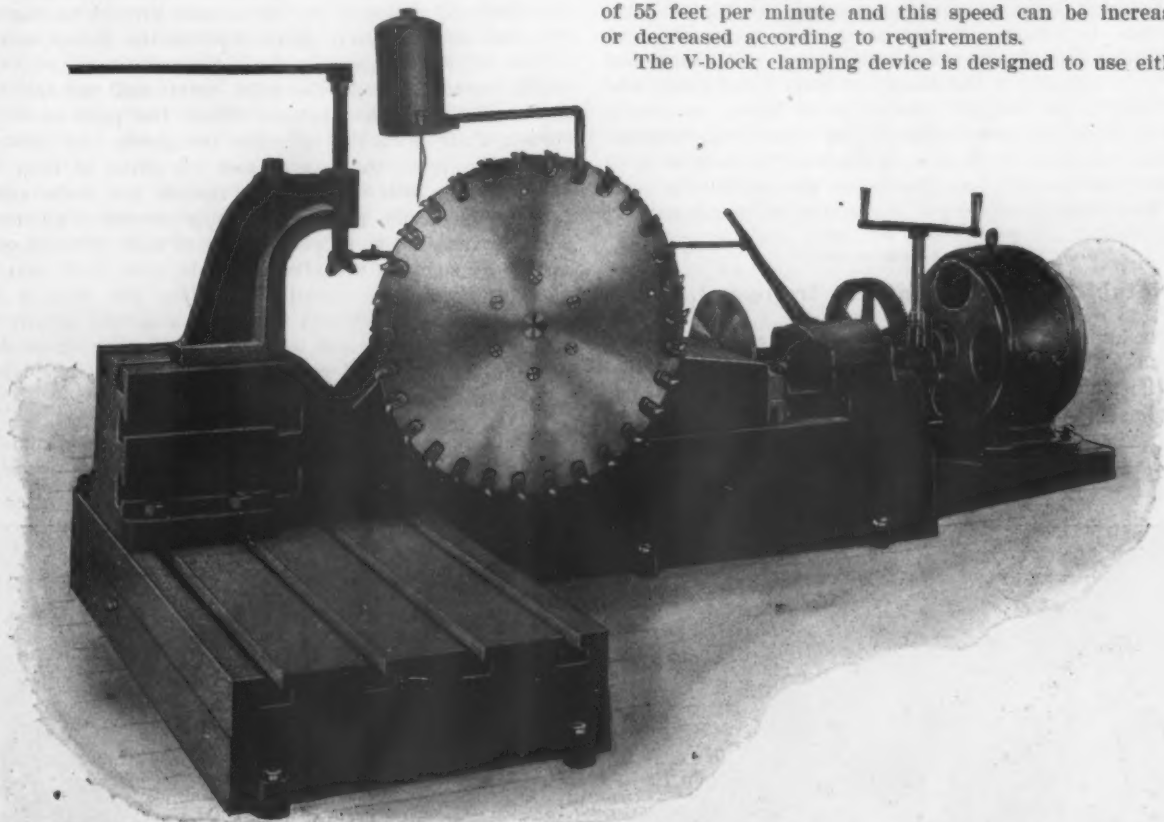


Fig. 1.—The Railway Appliances Company's New Cutting Off Machine Fitted with a Taylor-Newbold Saw.

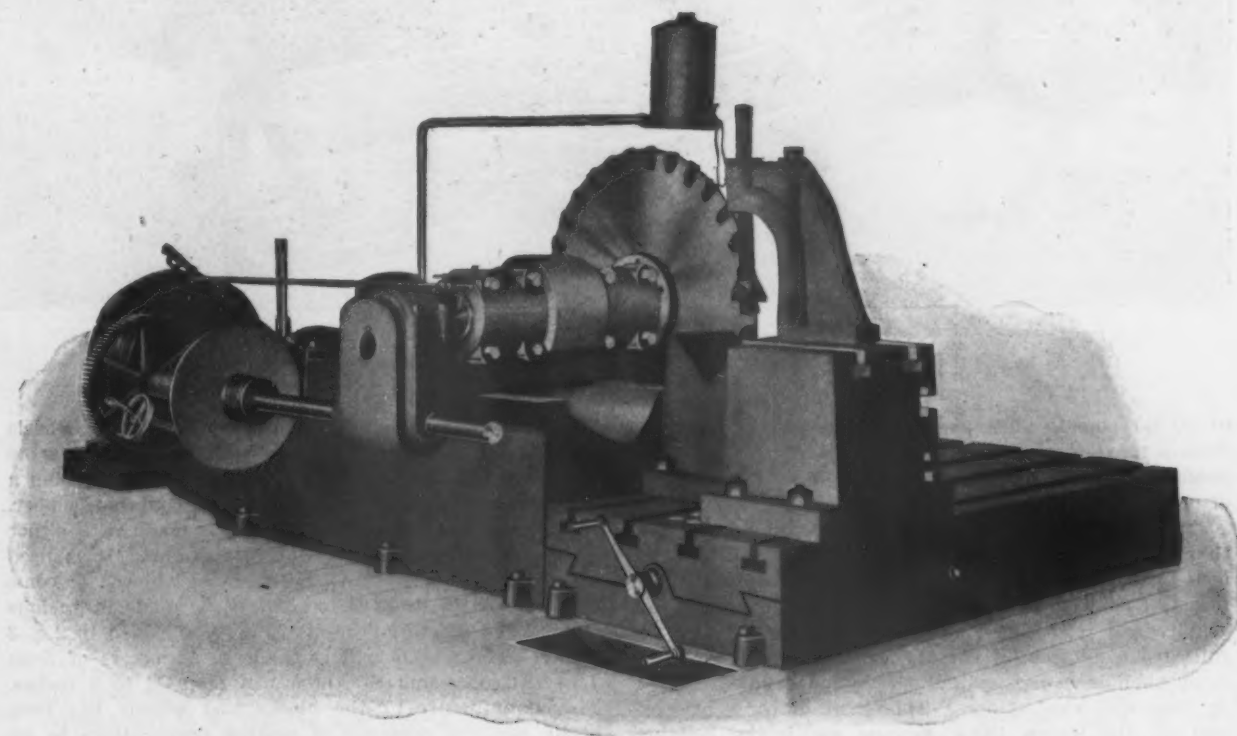


Fig. 2.—A View from the Opposite Side of the Cutting Off Machine of the Railway Appliances Company.

This machine is built heavier than usual and is designed to drive any of the modern cold saws with inserted high speed steel cutters. Figs. 1 and 2 show two views of a machine fitted with a 33-inch Taylor-Newbold blade, which is capable of cutting off risers up to 11 inches in diameter, handling successfully the hardest

one or two clamps and also to use lateral bolts for securing in a fixed position castings of irregular shapes. The regular arrangement for securing the material to be cut makes it possible to accomplish the setting of work at the expense of very little time and labor. As may be seen from Fig. 2 the main table on which the V-block

clamp rests may be adjusted transversely to the plane of the saw by a crank and screw, which facilitates the positioning of the work. The clamp over the V-block is secured in a slot so that it may be adjusted at right angles to the axis of the work.

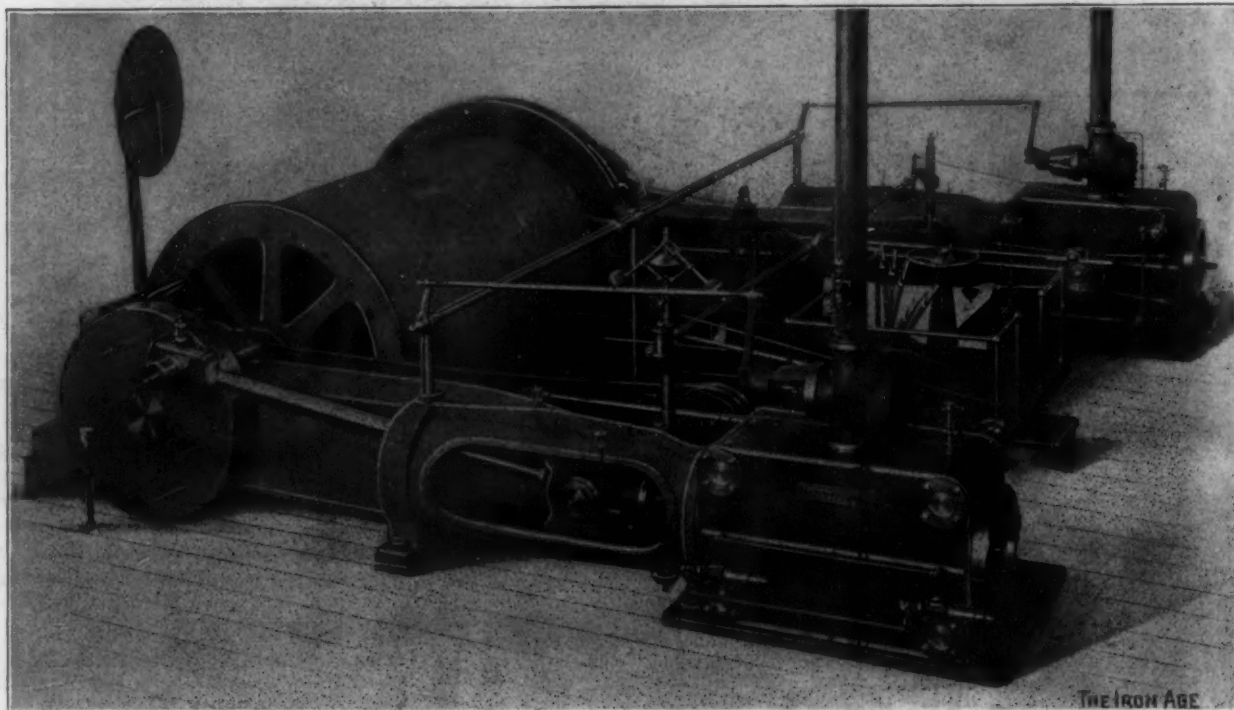
The solidity of the design of the machine is effective in reducing noise and vibration and the use of steel castings for many of the parts has minimized the weight. Three of these machines were recently furnished to various plants of the American Steel Foundries. One machine in the Indiana Harbor plant has a peripheral saw speed of 70 feet per minute, and is now being used for cutting off risers from steel castings at the rate of $\frac{3}{8}$ to $\frac{1}{2}$ inch per minute. As illustrated the machine is built for direct motor drive, but it can also be furnished for belt drive.

A Notable Hoisting Plant at Ironwood, Mich.

An interesting hoisting plant has lately been installed at the A shaft of the Newport mine at Ironwood, Mich., by the Thompson-Greer Company, Chicago. The hoisting drum is driven by a double Corliss engine, and will be used to raise the ore from a very large deposit recently opened up. The plant is built for a gross load

the advantages of the globe valve, since it has a conical seat and when closed is under full pressure. In addition it has the balance feature, which allows it to be opened easily, but at the same time precludes fluttering. The valve consists of what is practically a globe valve with a conical disk attached to a piston. Extending through the disk and piston is the valve stem proper, having on the disk end the pilot valve and on the piston end a second valve. In operation when the valve stem is moved steam rushes through the pilot valve and through the piston direct to the engine. When the pilot valve is thrown fully open the valve on the piston end cuts off the steam from the engine and its effect is then on the piston, which immediately throws the main valve into balance and permits it being moved with ease. These valves can be so balanced as to open of their own accord as soon as the pilot valve is open, and then to close of their own accord just before the pilot is entirely closed. This system is claimed to permit admirable regulation of steam and to have proved very successful in handling large and rapid first motion hoisting plants.

The Springfield Tire & Rubber Company, Springfield, Ohio, has recently been granted a patent on an abrasive



Hoisting Engine Installed at the Newport Mine, Ironwood, Mich., by the Thompson-Greer Company, Chicago.

of 20,000 pounds at a speed of 3000 feet per minute from a maximum depth of 4000 feet with steam at 150 pounds pressure. It was built in 54 days from receipt of order and 31 days later was hoisting ore.

The handling mechanism is all power operated, and the hoist acts so quietly that its operation cannot be detected except by the eye. The brake engine is of the differential floating lever type, the brake being held on by gravity and released by steam. The clutch engine is a full stroke differential cataract controlled engine. The drum shell is in two cylindrical sections and is carried on three split steel spiders. The clutch driver is of steel and all the levers, links, &c., on which the hoisting strains come are open hearth steel forgings.

Greer balanced throttle valves control the supply of steam to each cylinder of the engine. They close of their own accord when the lever is released, are seated under full pressure when closed and are only in balance when open. Some of these valves, using 150 pounds steam pressure, which have now been in use over two years, are stated by the maker to be still perfectly tight.

The Greer balanced valve is described as having all

compound from which to manufacture polishing wheels and blocks. Its purpose is to remove rust and spots and to clean and polish steel and other metals, giving a fine surface without scratching. It contains rubber, which gives the resilient effect, and is made with either emery or carborundum in different grades. It is used dry or with water, but oil must not be allowed to come in contact with it. The blocks will be made in various lengths and in cross sections from $\frac{1}{4} \times 1$ inch to 2×3 inches. The wheels will be made in diameters of from 2 to 18 inches and thicknesses of from $\frac{1}{4}$ to 4 inches. The manufacture of the blocks and wheels has been begun and the company is making preparations to introduce them as rapidly as possible.

In a bulletin on the coal industry of Indiana now in preparation Joseph H. Stubbs, Chief of the Bureau of Statistics, will place the production at 9,762,909 tons. This was 1,100,000 tons less than in 1903, on account of shutdowns for various causes. The number of mines increased in the year from 125 to 182. Coal is mined in 14 of the 92 counties of the State.

The Milwaukee Society of Mechanical Engineers.

An organization of this new society was effected at a meeting, held September 13 at the Hotel Pfister, Milwaukee, Wis. It is an outgrowth of the old Milwaukee branch of the American Society of Mechanical Engineers, and is the result of the local desire to have one general society the membership of which shall include electrical, civil and mechanical engineers, architects, metallurgists, mechanics and shop superintendents and managers. Under the rules of the American Society of Mechanical Engineers the Milwaukee branch could not enroll as members any other than mechanical engineers.

The new society starts off with 50 members and it is

L. Tift, with Allis-Chalmers Company. For one year: George M. Conway, consulting engineer; S. L. G. Knox, manager of the Bucyrus Steam Shovel & Dredge Company; George Warg, manager of the National Blower Company.

The Draper Convertible Gap Lathe.

A 22-inch gap lathe, especially adapted for use in steam and street railroad repair shops for truing up car axles without removing the wheels, is now being manufactured by the Draper Machine Tool Company, Worcester, Mass. Its object is to do away with the necessity of forcing the wheels off and on before and after truing the axles and so save the time lost by that procedure. If this were not done it would ordinarily re-

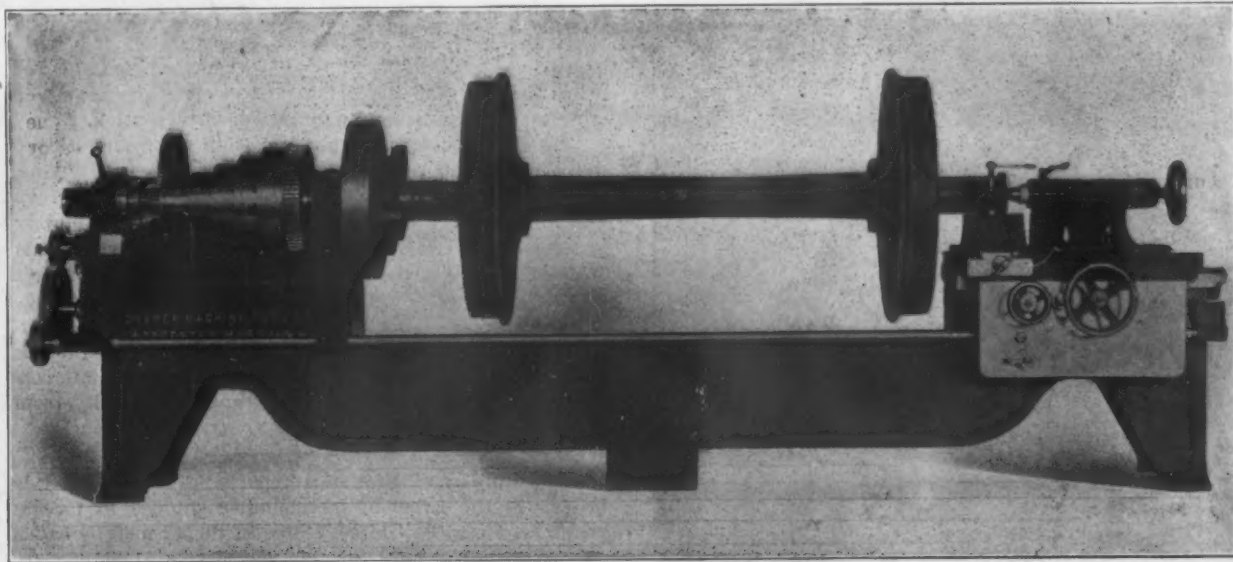


Fig. 1.—Special Draper Gap Lathe for Truing Car Wheel Axles Without Removing the Wheels.

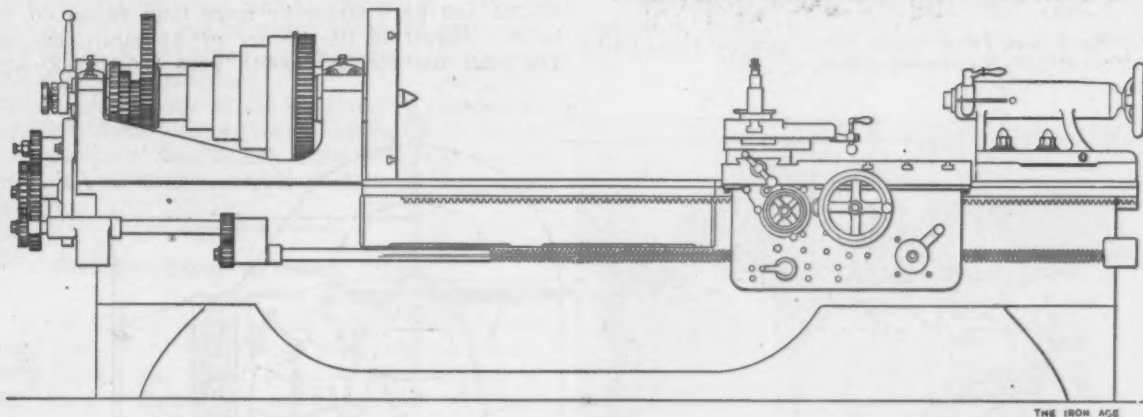


Fig. 2.—The Lathe with a Block Inserted in the Gap, Converting it into an Ordinary 22-Inch Engine Lathe.

expected that it will soon reach a membership of at least 200. Monthly meetings will be held at which papers on technical subjects will be read and discussed. Officers were elected as follows:

President, George P. Drave, consulting engineer.

Vice-president, C. J. Davidson, chief engineer of the Milwaukee Street Railway Company.

Treasurer, E. P. Worden, mechanical engineer of the Prescott Pump Company.

Secretary, W. G. Starkweather, with the Allis-Chalmers Company.

Directors: For three years: F. P. Breck, chief engineer of Pawling & Harnischfeger; H. A. Allen, with Allis-Chalmers Company; James De Voy, mechanical engineer of the Chicago, Milwaukee & St. Paul Railroad. For two years: Prof. Warren S. Johnson of the Johnson Electric Service Company; C. W. Burkett, chief engineer of the Wisconsin Telephone Company; George

quire a 42-inch lathe to swing the axle and wheels assembled.

The lathe illustrated swings 22 inches over the ways and the largest standard car wheels may be admitted over the gap. The bed is 13 feet long and the greatest distance between centers is 7 feet 8 inches. The lathe is furnished with a rod feed and plain block rest, as shown. It does not differ in mechanical detail from the engine lathe regularly manufactured by the Draper company, the only change being in the apron, where the usual positions of the longitudinal and transverse feed mechanisms are reversed, as in other gap lathes.

Fig. 1 shows the lathe as it appears with work in position. The lathe is also made with a block to fill the gap, compound rest, lead screw and gears for screw cutting, as shown in outline in Fig. 2, so that it may be used as a regular engine lathe when not being employed for truing up axles.

The Pitman Pelton Water Wheel.

A 50 horse-power multiple nozzle Pelton water wheel of English construction is illustrated in the accompanying engravings. It is manufactured by Percy Pitman, hydraulic engineer, Bosbury, Ledbury, England, and is designed to develop its rated brake horse-power at a speed of 135 revolutions per minute when using 700 cubic feet of water per minute under a head of 50 feet. The most distinctive feature of the wheel is the multiple nozzle. The water enters through a 24-inch inlet and is distributed through separate hand valves to each of the

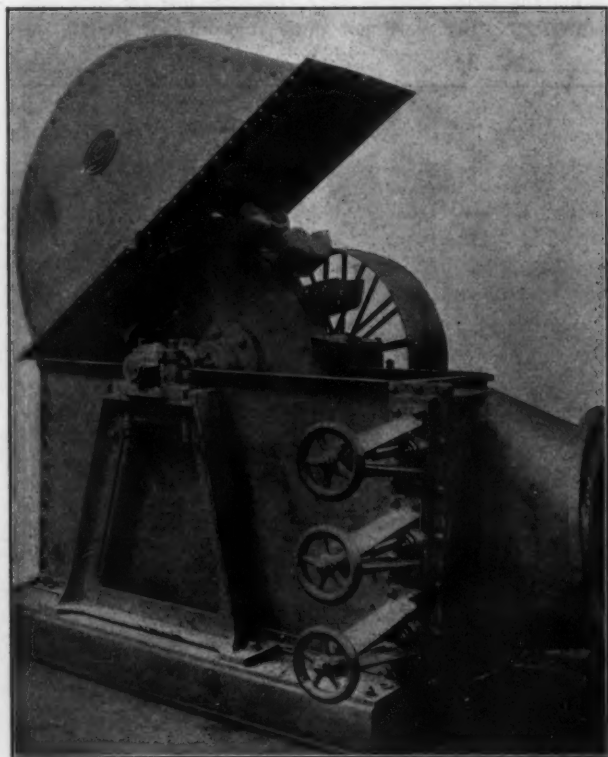


Fig. 1.—The Pitman Pelton Water Wheel, with the Upper Half of Casing Raised.

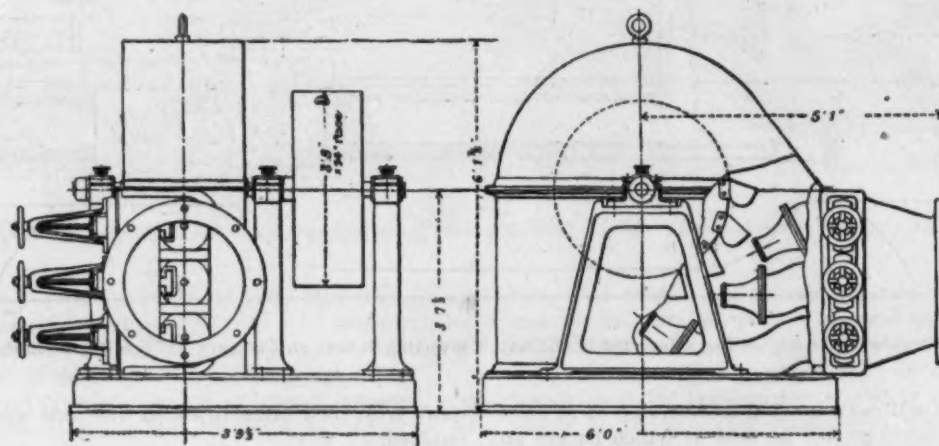


Fig. 2.—Line Elevations Giving the Dimensions and Showing the Arrangement of the Nozzles.

three nozzles. The valve screws are double threaded and are entirely outside of the casing, the spindles being provided with stuffing boxes. As a consequence the bonnets are easily removable and the valves can be withdrawn when necessary without breaking any pipe joints. The nozzles, each of which is $3\frac{3}{4}$ inches in diameter, and the buckets, bearings, valves and their seats are of phosphor bronze to avoid corrosion and the reduction of efficiency which it would entail.

The wheel proper is of steel plate $\frac{1}{2}$ inch thick and is 4 feet in diameter. It is keyed to a 3-inch shaft, which is turned and balanced after the wheel is mounted on it.

As Fig. 1 shows, the buckets are widened out at the sides more than is customary, the purpose being to allow the water to spread and leave the wheel freely after its velocity has been abstracted. The arrangement of the nozzles is indicated in the broken section in Fig. 2. Though it is not shown in the illustrations the lowest nozzle is fitted with a spear rod regulator manipulated by a screw and hand wheel. This allows the close regulating of the speed and power and allows the wheel to be run with a very reduced water supply without reduction in efficiency.

The casing is built up of $\frac{1}{4}$ -inch steel plates secured to an angle iron frame by $\frac{1}{2}$ -inch rivets 3 inches apart. All joints are calked and made absolutely water tight. The buckets and nozzles are made conveniently accessible by arranging the top half of the casing so that it may be lifted off, as shown in Fig. 1, and if desirable half of one of the lower sides may also be removed. The motor is illustrated without any speed governor, but when required one of centrifugal type is furnished, making the wheel suitable for the driving of electric generators or other machinery demanding close speed regulation.

These Pelton water wheels are built for any fall of water and to operate on high pressure hydraulic mains. For low pressure service, such as the ordinary town water supplies afford, Mr. Pitman builds the Hector water motor. It is intended for the driving of all kinds of small machinery, and is frequently made up in direct connected generator sets, to be used for charging storage batteries or supplying light or power in moderate quantities. The wheels are of similar construction to the one described, and are operated with three nozzles, all controlled by one hand valve. They range in capacity from 1-30 to $2\frac{1}{2}$ horse-power.

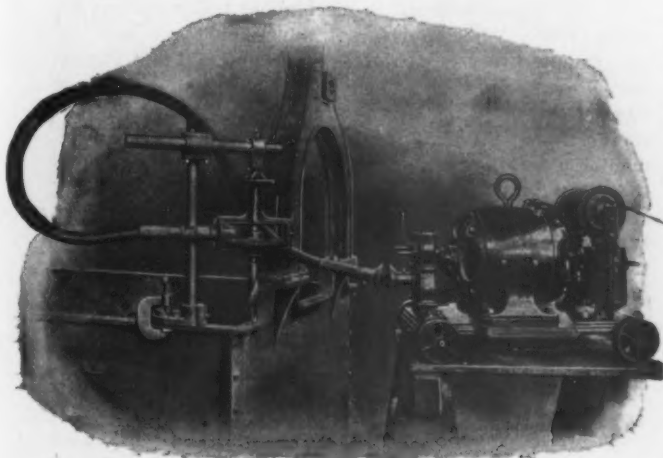
The Bureau of Statistics reports all export records broken in the value of merchandise shipped to foreign countries from the United States in the 12 months ended August 31. The total for this period was \$1,566,468,308, against \$1,457,044,909 for the 12 months ended August 31, 1904, and against \$1,501,212,938 for the year ended on the same date in 1901, which was the record year prior to this. The August exports were valued at \$117,453,581 and were larger by more than \$9,000,000 than in any August in the history of American commerce. The total imports last month were \$95,826,548, which

was also an August record. The imports in August of last year were \$87,737,868.

The Philadelphia Company of Pittsburgh has completed the building of a large gas main, to be used in conveying gas from the West Virginia fields to Pittsburgh. The new main will increase the supply of fuel gas by the Philadelphia Company 75,000,000 cubic feet per day. A number of new service mains have been laid in Pittsburgh and the existing mains have been improved, so that the company expects to have better gas service than ever before in Pittsburgh this winter.

The Gem Electric Portable Drill and Grinder.

A new portable electric plant for drilling, grinding and similar work is now being offered by the Gem Mfg. Company, Pittsburgh, Pa. The machine may be fitted with any of the standard electric motors. The drive from the motor to the drill, or grinding wheel, is through a flexible shaft, which has been a well-known product of the company for some time. As shown in the accompanying engraving the motor is mounted on a cast iron



A Portable Electric Plant for Drilling and Grinding, Made by the Gem Mfg. Company, Pittsburgh, Pa.

truck. Attached to the motor shaft is a gear case containing a set of reduction gears providing three spindle speeds, selected to cover the variation demanded by the character of work to which the plant is applied.

At the rear of the truck is a starting box of the standard no-voltage release type, which is wired to the automatic connection reel. The reel carries from 50 to 100 feet of insulated cable, and as continuous contact is maintained the truck can be moved about the work without the necessity of cutting off the current or disturbing the electrical connections.

The motors used are of the semi-enclosed pattern, allowing ready inspection without removing cover plates. They are furnished for 110, 220 or 500 volt direct current circuits and will carry an overload of 50 per cent. without sparking.

Flexible Steel Armored Hose.

It is well known that the high heat of steam causes the inner tube of ordinary rubber steam hose to lose its elasticity because the rubber becomes overvulcanized or burned. This is particularly so if subjected to a high steam pressure the temperature of which exceeds that employed in vulcanizing. The steam pressure causes some expansion of the hose, and when the pressure is released the inner tube loses its life and elastic qualities and is bound to break eventually. As soon as the steam is turned on again it enters the interior of the hose through these breaks and tears the rubber away from the cloth insertions. The rubber then disintegrates and is carried forward into the steam parts of the machinery operated, causing in some cases serious damage and loss of time. The tearing away of the inner tube leaves the cloth insertions bare, and in a short time the hose will become useless, as the steam will blow a hose with a damaged inner tube to pieces.

A new type of steam hose known as flexible steel armored hose, made by the Sprague Electric Company, 527 West Thirty-fourth street, New York, is claimed to overcome these defects. The nature of the armor prevents expansion, and the armor strips are so tightly interlocked that it is impossible for the steam to blow the hose to pieces. Another objection to ordinary hose is that in being dragged around rocks, &c., it is likely to

kink. Kinking will break the hose from the outside in a short time, and the hose then being unable to stand the necessary pressure will burst. This kinking is also overcome in the flexible steel armored hose, as the armor maintains a uniform internal diameter, making it impossible for the hose to kink in the armor.

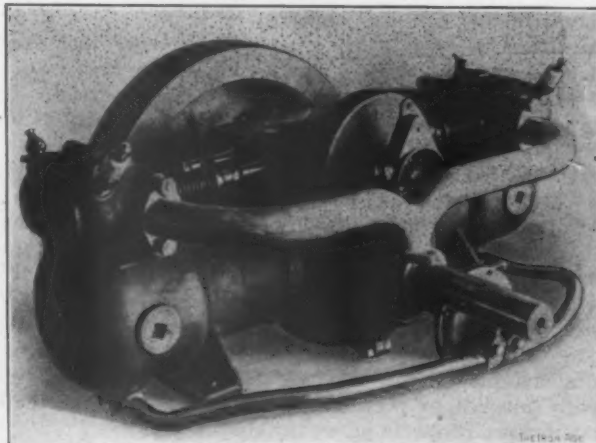
Remarkable durability is another feature claimed for the flexible steel armored hose. The armor eliminates the destructive strain of expansion, entirely incases the rubber lining and protects it from external injury of every kind.

This hose is not to be confused with wire wound hose or any hose where the armor separates sufficiently to permit the steam to escape in such volume as to render the hose immediately useless. The steel armor of the flexible steel armored hose entirely covers the inner rubber hose and is interlocking, so that if it should happen that the inner rubber hose becomes damaged the flexible steel armor prevents an open rupture, with the result that sufficient steam pressure is maintained to continue the use of the hose. A drill or other machine can thus be continued in use with a damaged hose until it is convenient to replace it with another piece.

The Davis Gasoline Motor.

In the illustration is shown a gasoline engine with two opposed $4\frac{1}{2} \times 4$ inch cylinders, built by the Davis Mfg. Company, 935 Thirtieth street, Milwaukee, Wis. This engine is of neat and rather novel design in the form of its castings. One-half of the crank case is cast integral with the cylinder to avoid bolting the cylinders to the crank case. After removing the crank case cover the cam rollers, guides and cam shaft can be lifted out, giving free access to the connecting rods. The main bearings are bronze. The connecting rods are hollow and of box section and are babbitted at the crank ends. The crank pins are oiled through the crank shaft, and the oil is taken from each crank pin through its rod to the pin in the trunk piston. The valves can be removed by unscrewing a plug at the end of each valve chamber.

The engine complete, with inlet pipe, exhaust pipe and pump, weighs 165 pounds, and when a fly wheel is furnished it adds 75 pounds, making the total weight 240



A 12-14 Horse-Power Gasoline Engine, Made by the Davis Mfg. Company, Milwaukee, Wis.

pounds. The engine has developed 15 horse-power on the testing floor, but it is only rated at from 12 to 14 horse-power. In one form the engine is built with an automatic pump oiler, which is made part of the cap of the crank case. This pump delivers a certain amount of oil to each bearing and feeds only when the engine is running and in direct proportion to the speed of the engine. The oiler requires no adjusting, it being only necessary to fill the reservoir with oil, after which it will automatically take care of the lubricating of the engine without further attention.

Customs Cases Before the Courts.

When the United States courts reconvene next-month their calendars will contain an unusually large number of customs cases of interest to the iron and steel industries. Several of the issues are of such importance that they will eventually be carried to the Supreme Court. The questions to be determined by the courts relate to the classification of various articles of trade, and as the final decisions of the courts have a direct bearing on the rate of duty chargeable on similar commodities the litigations will be followed closely by importers in the lines concerned.

In order to expedite customs cases both the Federal Circuit Court and the Circuit Court of Appeals in this district are making arrangements to devote more time this year to the consideration of tariff litigation than formerly. This plan, it is believed by the Departments of Justice and the Treasury, will have a wholesome effect in disposing of importers' cases without the long delay frequently encountered in the past.

Steel Forgings.

One of the most interesting questions to come before the Circuit Court involves the classification of forgings imported by Thomas Prosser & Son. The firm contends that certain steel articles found by the Board of United States General Appraisers to have been forged and subsequently finished or nearly finished in the machine shop, and held to have been properly classified as manufactures of steel not specially provided for, should have been held dutiable as forgings, or else as steel in all forms and shapes not specially provided for. Another claim is that the forgings are dutiable under the law's provision for pressed, sheared or stamped shapes of steel. The importers also object to the action of the Board of Appraisers in assuming jurisdiction over the protests in question when, as alleged, another board had previously acquired jurisdiction, given a hearing and reached a conclusion favorable to the protestants.

Steam Plows.

The United States Circuit Court for the Northern District of California will be called upon to decide what rate of duty is applicable to steam plows. The machinery involved in this suit was imported by E. R. Lillenthal & Co. The Treasury Department took the view that the plows are manufactures of metal, with duty at the rate of 45 per cent. ad valorem. The importers, however, claim a 20 per cent. duty under the paragraph in the tariff law for "plows." The Treasury's contention rests on the assumption that motor plows are not the kind of "plows" provided for in the law. Inasmuch as the steam plow is coming into greater use all the time in the United States, the final settlement of the classification of the article is awaited with interest by importers as well as domestic manufacturers of similar articles. The difference in the two classifications is sufficient to materially reduce profits to the importers, while American makers of steam plows fear that the lower rate of duty, if finally allowed to prevail, may unfavorably affect the manufacture of motor plows in this country.

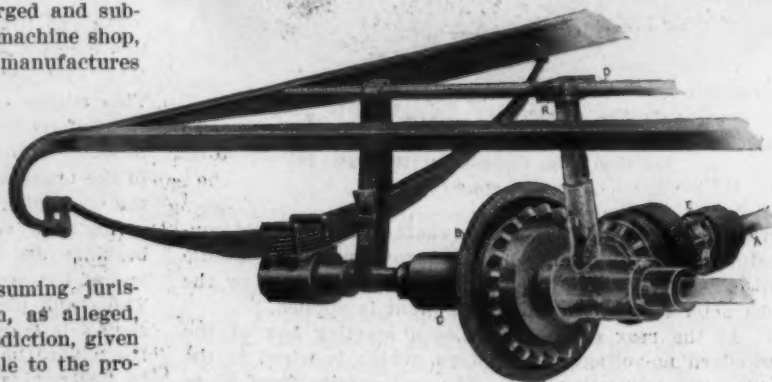
Miscellaneous Cases.

Another important issue to be decided will come before the Circuit Court at Philadelphia. The suit is brought by the United States against O. G. Hempstead & Son, agents for importers whose names do not figure in the litigation. The question is whether certain magnesite brick, used for lining open hearth furnaces, are "fire brick" within the meaning of that term as used in the tariff law. Other important classification cases stand in the names of F. B. Vandegrift & Co., sheared steel shapes; United States vs. R. D. Wood & Co., steel plates; R. L. Ginsburg & Sons, old fish plates; Burditt & Williams Company, wire rat traps; Wetherell Brothers, sheet steel in strips; United States vs. Thomas Riessner, flitters; Albert Eckstein and others, nickel plated zinc sheets; Hermann Boker & Co., coated nickel wire; United

States vs. R. Hoe & Co., patterns for machinery; United States vs. the Roessler & Hasslacher Chemical Company, unwrought metals, ferrochrome, ferromanganese, &c.

A Novel Roller Gear.

A departure in gear drive was made in this year's models of the Haynes automobile, built by the Haynes-Apperson Company, Kokomo, Ind. It is styled a roller gear and sprocket and takes the place of a set of bevel gears in transmitting the power from the longitudinal engine shaft to the rear axle. For angle drives bevel gears have been common in mechanical transmissions for many years. Their principal advantage over belt arrangements are a positive drive without slip and the reduced space required. Their poor transmission efficiency has always been an objection, for it is well known that their friction is relatively high. Probably in the automobile more than any other mechanism it is desirable to reduce this friction, and as there is the keenest of rivalry in automobile design it is not surprising that this suggested substitute comes from this industry. Chain transmissions have less friction than bevel gears and have been very generally used in automobiles, but they seem to have other disadvantages that have caused many builders to abandon them in favor of gears.



The Roller Gear Axle Drive on the Haynes Automobile.

The new roller gear is claimed to have been severely tested and to have proved successful. Its principle is clearly brought out in the illustration herewith, from which it will be seen to consist of a bevel pinion having teeth in the form of rollers and a sprocket resembling a modified bevel gear. It avoids the long thin teeth found in ordinary bevel gears and for that reason has greater strength and a reduced tendency to break. When in action two rollers are always engaged with the sprocket teeth, the shape of the latter being designed for that condition. This gear is said to eliminate thrust and to combine the virtues of the chain driven sprocket wheel and bevel gears. Both the sprocket and the roller gear revolve in a dust proof oil bath.

The New England Foundrymen's Association.—This organization held its first meeting after the summer months at the Exchange Club, Boston, September 13, with President John Magee in the chair. Dinner was served at 6 o'clock, and afterward routine business was transacted, including the election to membership of the S. Obermayer Company, New York. Announcement was made that the association had accepted an invitation from the United Shoe Machinery Company to visit its new plant at Beverly, Mass., on the afternoon preceding the next meeting, October 11, the meeting to be held at the usual place, the Exchange Club, in the evening. A committee consisting of William C. Doherty, Doherty Brothers, Lowell; C. J. Calay, Russell & Erwin Mfg. Company, New Britain, Conn., and A. J. Miller, Jr., Whitehead Brothers Company, Providence, R. I., was appointed to canvass for membership and attendance at the meetings. The speaker of the evening was E. H. Mumford, Philadelphia, his topic being "A New Multiple Molding Process."

The Action of Blast Furnace Gas on the Furnace Lining.

The publication by Frank Firmstone in the *Transactions* of the American Institute of Mining Engineers of analyses of fire brick from the upper part of a blast furnace, which had been disintegrated by the action of the gases, has led T. Ludwig, Berlin, Germany, to investigate the cause of such action and incidentally to evolve a theory as to the action of cyanogen in the furnace, concerning which he writes in a recent number of *Stahl und Eisen*. To begin with he recalculates Mr. Firmstone's figures, using the amount of alumina as a unit, as at the temperature involved it would be impossible to gasify or melt out that compound; and, furthermore, expressing the quantities in molecules instead of by weight. The analyses are those of the unused brick, the same when spoiled by the gas and also the fused, glasslike mass which ran off and covered the surface. In their original and recalculated forms the figures are as follows:

	Original.—Per cent.			Revised.—Molecules.		
	New brick.	Spoiled brick.	Fused mass.	New brick.	Spoiled brick.	Fused mass.
Alumina, Al_2O_3	38.55	31.64	12.22	1.000	1.000	1.000
Silica, SiO_2	55.62	57.63	40.23	2.453	3.096	5.597
Ferrous oxide, FeO	4.17	3.73	11.93	0.153	0.167	1.099
Lime, CaO	0.24	0.24	10.92	0.011	0.014	1.591
Magnesia, MgO	0.24	0.11	4.31	0.016	0.009	0.899
Potash, K_2O	0.95	2.59	0.39	0.207	0.089	0.834
Soda, Na_2O	0.29	0.51	8.43	0.012	0.027	1.135
Metallic iron,* Fe	1.51	.....	.....	.....	.....	.....
Zinc oxide, ZnO	0.59	.....	.....	.....	.....	.....
Totals.....	100.06	98.55	97.43	.....	.....	.....
Total fluxes.....	.....	.....	.....	0.210	0.306	5.558

* This iron existed in the form of small shot.

The spoiled brick therefore shows a marked increase in silica and alkalis, the other constituents remaining practically unchanged. In the fused mass, on the other hand, all the fluxing materials, as well as the silica, have increased to an astonishing degree. The analyses would indicate that at the existing temperature the fused portion would run, while spoiled brick would be quite infusible. As regards the method by which these constituents have found their way into the brick, experiments in the laboratory of Seger & Cramer (Berlin) and elsewhere show that it is perfectly possible to volatilize the alkalis, magnesia and ferric oxide, so that it is not surprising that the gases contain considerable quantities of these substances, which are deposited in the cooler parts of the furnace.

It is harder to explain the sublimation of lime and the existence of large quantities of silica in the gaseous form, and it is to account for the latter that Mr. Ludwig advances his theory, emphasizing that it is but a theory and not a proved fact.

In a blast furnace cyanogen is always present in considerable quantity. This compound has chemical characteristics closely resembling those of the halogens—namely, chlorine, bromine and iodine. These three elements when passed over an incandescent mixture of silica and carbon form compounds of silicon—i. e., silicon chloride, bromide or iodide, as the case may be. Cyanide of silicon has never yet been isolated, but the necessary conditions for the formation of such a compound are present in a blast furnace, if anywhere. All compounds of cyanogen are formed at a high temperature, which is present there, as is also incandescent carbon in contact with silica. Accordingly the hypothesis must not be rejected off hand that a silicon cyanide is formed which volatilizes at a high temperature and at a low one decomposes with deposition of silica.

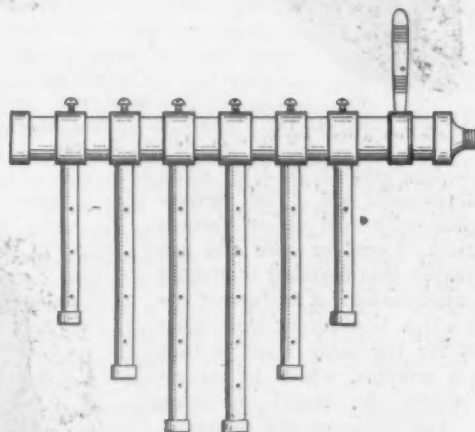
That such a compound has not been heretofore produced may be explained by supposing that silicon cyanide can only exist at a high temperature, whereas at a lower one in presence of water or air it breaks up. This supposition is supported by a consideration of the heat of formation. Reasoning by analogy with other silicon-halogen compounds, it is probable that this, in the case of silicon cyanide, is negative, in which event its formation at a high temperature only is easily explicable. Silicon iodide disassociates so readily that it ignites of itself on

exposure to the air. It may be that the operation is more complicated than indicated above, and that instead of a cyanide a more complex compound of cyanogen is formed, as is the case if nitrogen is passed over an incandescent mass of lime and carbon when, instead of calcium cyanide, calcium cyanamide results. The theory stated above is not put forward as a definite explanation of the large amount of silica present in furnace gases, but in the hope that it will stimulate further investigation of the subject.

The Gronvold Boiler Flue Cleaner.

The Gronvold steam boiler tube cleaner is intended to be installed as a permanent fixture in high pressure boilers. To clean the tubes it is unnecessary to reduce the steam pressure and so stop the engine or to raise the doors in front of the flues. To install a cleaner in a boiler requires only the drilling of the shell to take the two ends of the horizontal part, as seen in the illustration. To this part is affixed by means of a collar a lateral for each vertical line of tubes, each lateral having an opening opposite the end of each flue. The handle end of the cleaner protrudes beyond the boiler shell so that it may be manipulated from the exterior, this involving the turning of the handle to its various positions.

The horizontal part consists of two tubes, one within the other. The handle is fastened to the inner tube, which rotates within the outer tube. The latter has an opening opposite each of the laterals. There are corresponding openings in the inner tube through which the steam is admitted to the cleaner. These inner openings are not in one line, but in three lines, so that steam can be admitted to only one-third of the flues at one time. This is true regardless of the number of



The Gronvold Improved Steam Boiler Flue Cleaner.

flues, or laterals. A turn of the handle brings openings of the inner tube in line with those of the outer tube opposite the first one-third section of laterals. A second turn cuts off the steam from this first section and admits it to the middle group of laterals, and the third position of the handle brings into action the last section of the laterals.

While steam is being admitted under pressure to one-third of the flues their contents may be discharged through the remaining two-thirds of the flues into the fire box and thence into the chimney. No dust or ashes escape into the boiler room, and the fireman is relieved of the most unpleasant of his duties and one that he is most inclined to shirk.

The Gronvold flue cleaner is manufactured by the E. A. Burgess Estate, C. A. Bradley, manager, 67 Court street, New Haven, Conn.

An admirable statistical compilation has been recently made by the Comité des Forges de France. It covers the statistics of production and of exports of iron and steel from 1870 to 1903 of the five leading countries; France, Germany, Belgium, Great Britain and the United States. It is embellished by a series of special diagrams.

The Steele-Harvey Metal Melting Furnace.

In another part of this issue is printed a paper read before the Pittsburgh Foundrymen's Association which gives the results of tests of a Steele-Harvey metal melting furnace. It was thought of interest to give in this connection a brief description of the furnace, which is intended for melting metals and is manufactured by the



Fig. 1.—The Steele-Harvey Furnace in Melting Position.

Monarch Engineering & Mfg. Company, Baltimore, Md. The furnace is supplied with fuel oil or natural gas instead of coal or coke and has demonstrated that economy is effected by this substitution. A feature of the furnace which is different from most designed for the same work is that it uses a crucible, which is not removed while the metal is being poured. The claim of the manufacturers is that unless the melting is done within a crucible a thoroughly satisfactory mixture cannot be obtained. There are undoubtedly points of convenience worthy of consideration in the operation of a furnace with oil or gas, such as the doing away with the noxious sulphur fumes from coal and coke and the necessary dirt and labor connected with the handling of ashes and cinders, to say nothing of the metal which is lost with the ashes.

The accompanying Figs. 1 and 2 give two views of the furnace, one as it appears in the melting position and the other as it appears when being poured. The furnace is placed on the ground in the foundry and is connected with the necessary air and oil or gas piping. The use of the crucible avoids the oxidation which necessarily results when there is an attempt to inject the flame directly against the metal. Hoods and stacks are not required, as there are no disagreeable gases such as arise from furnaces without separate crucibles. The furnace is described as easy to operate, one man being capable of taking care of four furnaces.

The furnace comprises an outer shell firmly riveted and lined bottom and sides with a double row of fire

brick and an air space between the inner wall of the fire brick lining and the crucible. The crucible rests at the bottom on a square edge graphite block against the edge of which the flame is played and circulates entirely around the crucible and upward toward the cover. The crucible is always retained within the furnace, consequently loses no heat by cooling off. It is secured in position by wedge shape fire brick. The cover consists of a circular slab of carbo-composition capable of withstanding intense heat. It is attached to an automatic lifting device which is swung from the right side above the tilting gearing, permitting the furnace tender to lift the lid and turn the wheel for pouring simultaneously. The furnace is hung between two upright trunnion supports and is tilted by a train of gears and a hand wheel, with which it is under perfect control and may be tipped to any angle desired. The burner uses oil and air, and is controlled by a main piston valve which operates with a needle point at the extreme oil outlet, giving a vaporizing effect and a freer circulation of oil and air.

The air burner has one air valve and two oil valves. The needle valve of the burner controls the air at the burner. The supply of oil is regulated by the other oil valve, and the needle valve is used only for adjusting the flame.

In connection with the operation of the furnace an air compressor of standard make is required, having a capacity of one and one-half times the amount of air needed by the burner.

The furnace occupies a floor space of about $3\frac{1}{2} \times 4\frac{1}{2}$ feet, and the height to the top of the shell is from 3 to $3\frac{1}{2}$ feet. Sizes are made to accommodate Nos. 40, 60, 125 and 275 crucibles. The burners require from 10 to 15 cubic feet of air per minute and are operated under from 50 to 80 pounds pressure, the economy being greater the greater the air pressure. The metal from the furnace is poured into a receiving bull ladle which is lined with a composition of carbo-sand, silicate soda and fire clay and has been previously heated.



Fig. 2.—The Furnace in Position for Pouring.

The foregoing pertains mostly to furnaces with oil burners, although they are also made for using natural gas. Where natural gas is available it is greatly to be desired, as it is the cleanest, most effective and economical fuel possible.

Announcement is made that the water tube boiler department of the Aultman & Taylor Machinery Company, Mansfield, Ohio, has been consolidated with the Stirling Boiler Company, Barberton, Ohio. It is understood that the new company will have \$4,500,000 capital, but further details as to the merger have not been disclosed. It is probable that the combination will have a decided effect on the boiler trade.

Steele-Harvey Brass Furnace Tests.*

BY WILLIAM T. KRAUSE.

At the brass foundry of the Maryland Steel Company, Sparrow's Point, Md., over which I have supervision in connection with the general foremanship of the iron foundry, when I first took charge some nine years since we had six coke furnaces in use. Our business increased and we were compelled to place six more in use, one of these for 300 crucibles. The others generally were for 100. We operated at a loss averaging 2.8 per cent. Several propositions were made in reference to oil furnaces, but being somewhat high in price the matter was dropped.

On one occasion our superintendent brought me an illustration of the Steele-Harvey melting furnace. I was very much impressed with it and requested him to get one on trial. The furnace arrived at our plant, and we had it installed ready for operation 24 hours afterward. Having an air compressor, it did not take a great deal of time to get matters in proper shape. We started the furnace green with 775 pounds of metal and ran out our first heat in three hours. In the afternoon we ran out two more heats, making a total of 2275 pounds for the day. After the builder's furnace tender operated the furnace for two days he was sent home. Our own man, who never saw an oil furnace in all his life, was then put in charge, and he learned to handle it very readily, taking the first heat of 765 pounds in 2 hours and 50 minutes. When he drew his third heat, which was ready for pouring at 5.10 p.m., he had melted for the day 2225 pounds. The amount of fuel consumed was 48 gallons, at a cost of \$1.20. A series of tests was made under my own supervision as follows:

First Day's Run.

1488 pounds metal. Time consumed for melting, 5 hours and 50 minutes. First heat, 750 pounds, placed in crucible at 7.30 a.m. Metal drawn from furnace, 10 a.m.

Second heat, 738 pounds. Drawn from furnace, 12.50 a.m. Loss in melting, 1.06 per cent. Amount of fuel consumed, 32 gallons, at a cost of 80 cents.

Second Day's Run.

Metal charged in four heats, 2252 pounds. Furnace charged, 6 a.m. First heat drawn from furnace, 8.55 a.m.

Second heat charged, 9.10 a.m. Drawn from furnace, 11.55 a.m.

Third heat: Furnace charged, 12.20 p.m. Drawn from furnace, 2.50 p.m.

Fourth heat: Furnace charged, 3.25 p.m. Metal drawn from furnace, 5.45 p.m.

Loss in melting, 1.10 per cent. Consumption of fuel, 56 gallons, at a cost of \$1.40.

Third Day's Run.

2579½ pounds of metal charged; four heats; time consumed in melting, 11 hours and 55 minutes; loss in melting, 0.96 per cent. Consumption of fuel, 65 gallons, at a cost of \$1.62.

Fourth Day's Run.

2534 pounds of metal melted; four heats; time consumed in melting, 11 hours and 10 minutes; loss in melting, 1.03 per cent. Consumption of fuel, 62 gallons, at a cost of \$1.55.

Oil in tank was measured before and after each heat.

On comparison with the above I will give data of four heats melted in a coke furnace a month previous to the installation of the oil furnace, as follows:

1465½ pounds metal melted; loss in melting, 2.7 per cent.; cost of fuel, \$1.98.

975 pounds metal melted; loss in melting, 2.8 per cent.; cost of fuel, \$1.24.

1547 pounds of metal melted; loss in melting, 2.8 per cent.; cost of fuel, \$1.89.

534 pounds of metal melted; loss in melting, 2.9 per cent.; cost of fuel, \$1.29.

The average loss in melting in the oil furnace for four days' run shows 1.06 per cent. against 2.8 per cent. for the coke furnace.

Synopsis of Test in Oil Furnace.

1,488 pounds.....32 gallons oil, cost \$0.80.....Loss, 1.06
2,252 pounds.....56 gallons oil, cost 1.40.....Loss, 1.19
2,579½ pounds.....65 gallons oil, cost 1.62.....Loss, 0.96
2,534 pounds.....62 gallons oil, cost 1.55.....Loss, 1.03

8,853½ pounds.....215 gallons oil, cost \$5.37....Aver. loss, 1.06
Crucible in 14 heats, pro rata cost.....6.50

\$11.87

Average cost of 100 pounds, including oil and crucible...\$0.134

* Paper read before the Pittsburgh Foundrymen's Association, September 11.

Synopsis of Coke Furnaces.

1,465½ pounds.....Cost of coke, \$1.98.....Loss, 2.7
975 pounds.....Cost of coke, 1.24.....Loss, 2.8
1,547 pounds.....Cost of coke, 1.89.....Loss, 2.8
534 pounds.....Cost of coke, 1.29.....Loss, 2.9

4,521½ pounds.....Cost of coke, \$6.40....Average loss, 2.8
Cost of crucible No. 275, average life,
nine heats.....8.67

\$15.07

100 pounds metal, average cost, including coke and
crucible.....\$0.33 1-3

At the request of one of our superintendents I made the following tests to ascertain the percentage of oxidation:

Test No. 1.

	Pounds.
Copper	350
Tin	30
Zinc	10
Scrap brass.....	150
Gates	185

Total.....725

Metal taken from pot.....722

Test No. 2.

	Pounds.
Copper	400
Tin	40
Zinc	10
Scrap brass.....	150
Gates	150

Total.....750

Metal taken from pot.....746

The metal taken from the pots, representing the actual quantity received, showed a loss in each test of 0.41 of 1 per cent. Both tests were made in new crucibles.

The life of crucibles has been while in use since December, 1904, an average of 24 heats. On one occasion we ran short of crucibles and I placed one in a furnace that had run seven heats in a coke furnace. This was set aside as being too risky to run more heats from; it stood 22 heats, making a total of 29 heats.

Our furnace ran six months before we were compelled to refine it, and then we only put in the inner course, leaving the outer course of bricks in, which are still in use; this work did not require the aid of a mason, but was done by the man who ran the furnace.

The life of the carborundum brick in the bottom of the furnace that acts as the seat for the crucible will last, with care and proper attention to slagging of the furnace, about two months. Stress should be laid on the furnace tender to keep the furnace free of slag by removing it when in a liquid state and to always have the crucible set in the center of the furnace firmly upon the carborundum base block, so as to secure a uniform flame and perfect combustion.

One thing must be understood, and that is, it is not an automatic arrangement. You do your part of the work and the furnace will do the balance.

The air pressure for working our furnace averages 80 pounds. Our air line to oil tank has a reducing valve connected to the air pipe, cutting down the pressure to 20 pounds. We were compelled to do this, as our oil tank was placed outside of the building and about 2 feet below the level of the furnace. Where the oil tank can be placed above the furnace pressure in the tank is not required. Care must be taken when operating the furnace to get thorough combustion. This can be accomplished in operating the air and oil valves.

Statistics are published of the production of iron and steel in the Russian Empire in 1904. These statistics show that Russia produced 2,978,325 metric tons of pig iron in 1904, as compared with 2,486,610 tons in 1903. The production in 1904 was the largest in the history of Russia, but was only about 40,000 tons more than in 1900. The production of steel ingots and castings in 1904 was 2,811,948 metric tons, against 2,410,938 tons in 1903. The steel output of Russia in 1904 was by far the largest in the history of the country. The quantity of steel rails rolled in 1904 was 401,541 metric tons, which has been exceeded in quite a number of previous years. The largest production of rails attained by Russia was in 1900, when 496,475 tons were rolled.

The Gamble in Cleveland Pig Iron.

The following interesting article, giving a history of the great British speculation in Cleveland pig iron and discussing its effect on the British iron trade, is taken from the *London Mining Journal* for September 2:

An Unparalleled State of Affairs.

When the history of the Cleveland pig iron trade comes to be written the course of events during the last nine months will receive more than usual attention at the hands of the writer, for they show most strikingly how a great trade can be disorganized and its business diverted by the action practically of outsiders, who have no real interest in the industry. A state of affairs has been brought about in the Cleveland pig iron trade which has not had its parallel since it was established a little over half a century ago.

The Scotch trade has not been a stranger to speculative dealings, as it lent itself in past years to them, seeing that there were enormous stocks of pig iron lodged in the public warrant stores in Scotland—about 1,250,000 tons at one time—and a speculator then was comparatively safe in operating in Scotch warrants. But the Scotch ironmasters determined that they would not continue to allow their trade to be the sport of people who had no real connection with the iron and steel industries, and at last they practically objected to let their iron be the counters for those who were neither more nor less than gamblers, but who nevertheless determined what prices of iron and what wages for men should rule. This was as it should be, because those who produced and consumed the iron had the best right to regulate the price thereof. Accordingly the Scotch makers ceased to produce more iron than the market required from them, and over a considerable period more Scotch iron was absorbed than was made, with the result that in the course of years the stocks of Scotch iron in the public warrant stores have dropped from 1,250,000 to about 17,000 tons, a quantity far too little for speculators to operate with any approach to safety, for they could easily be cornered.

Speculators Turn from Scotch to Cleveland Iron.

Not to be balked, the gamblers turned to Cleveland warrants for the counters with which to carry on their speculations, and now one hears comparatively little about the price of Scotch warrants. It is the quotation for Cleveland warrants to which attention is mainly directed; and whereas only 17,000 tons of Scotch pig iron are in the public stores, there are over 500,000 tons of Cleveland iron lodged with Connal's, of which six-sevenths have been added within a year, the rate of increase being altogether unprecedented.

The total make of pig iron from the furnaces in the northeast of England is about 3,750,000 tons, and of this nearly 2,250,000 tons are produced by Middlesbrough furnaces. Of this about 1,250,000 tons are ordinary Cleveland pigs, mainly No. 3, and till lately it was exclusively that quality which Messrs. Connal held; in fact, it is only this year since standard iron came to be quoted that they have been asked to store other qualities. It will therefore be seen what a large proportion of the production of ordinary Cleveland pig iron has not gone directly into consumption, but has been stocked instead; a most undesirable state of affairs, brought about solely by the artificial circumstances due to the gamble, for no one can contend that otherwise the production of Cleveland iron would in the ten months since that gamble started have exceeded the consumption by nearly 500,000 tons, when the total output is no more than 1,250,000 tons.

America Expected to Be a Large Buyer.

It appears that the operations of speculators, which began in earnest about last October, were really induced by the idea that was then widely countenanced that America would within a few months become a very large buyer of pig iron from this side of the Atlantic, and as Cleveland iron could be procured the most cheaply the requirements of American consumers from Europe would be satisfied by the Cleveland district, as they had been in 1902 and 1903, when Middlesbrough firms supplied 237,

307 tons and other firms in the northeast of England shipped very considerable quantities, the extent of which, however, cannot be stated as there is no public record. On the strength of the expectation that America would become a large buyer of Cleveland iron some of the speculators considered that it would turn out good business to purchase such iron and stock it, especially as there seemed to be indications of a revival of trade in other quarters. Their buying sent up prices and stocks rapidly, which was a circumstance contrary to general experience, for with ordinary trade the value of goods usually decreases as the stocks increase. However, not only did quotations rise, but they rose faster than had been known for years. Last year the lowest figure that had been reported for Cleveland warrants since 1898 was touched, 42 shillings 1 penny cash, and in October when the operations commenced only 43 shillings 2 pence was paid, but then an upward run of prices started, which progressed as under: Forty-four shillings was attained on October 25, 45 shillings on November 3, 46 shillings on November 4, 47 shillings on November 23, 48 shillings on November 28, 49 shillings on December 22, 50 shillings on December 27 and 51 shillings on December 30.

The American Demand Fails to Appear.

The demand from America did not materialize in this country, however, and prices on the warrant market fell back during January until 47 shillings 6 pence was touched about the 26th, and in February and March quotations fluctuated between that and 50 shillings, the month of March closing with 48 shillings 11½ pence cash as the buyers' rate. In April prices advanced at a very rapid rate again, and for this reason: A number of Middlesbrough, Newcastle and London speculators learned that some of the leading dealers in pig iron had sold Cleveland warrants extensively without covering fully and they formed a syndicate to buy up all the warrants that could be got, so as to prevent the dealers securing the iron they needed to enable them to fulfill their engagements except at the prices at which the syndicate of bulls chose to sell it.

Thus during April and May the syndicate bought up all the warrants that could be obtained and this led to another strong rise in their value, for 50 shillings was reached on April 14, 51 shillings on April 20, 52 shillings on April 28, 53 shillings on May 4, 54 shillings on May 9 and 55 shillings on May 19. It was on the last named date that dealers' deliveries chiefly fell due, and then they either furnished the warrants or paid the differences and the "corner" ended so far as they were concerned, but it left the syndicate saddled with an enormous quantity of warrant iron. The dealers did their best to deliver warrants, and they had competed keenly with the syndicate of bulls for any that could be got, that leading to the rapid advance in prices.

Pig Iron Makers Get Temporary Benefit.

The bears had practically enlisted the producers on their side, for they made it worth while for the blast furnace proprietors to let them have iron to send into the public warrant stores rather than supply it to general consumers, with the result that in May there was more iron going into the public stores than was being produced, the makers even denuding themselves of their stocks so that they might secure the high rates for iron which the dealers or bears were prepared to pay. Indeed, it was reported that some of the customers who had bought Cleveland iron had to go short, while the iron which they should have had was being sent into the warrant stores.

Brands of iron which had never previously been lodged in Connal's stores (owing to the makers thereof being averse to these public stores, and selling their iron with the express stipulation that it should not be sent in there) were now stocked in Connal's like the rest; in fact, there were only two firms who were proof against the temptation, and Connal's stores are still minus these brands. All the others succumbed and sold for storing purposes as much Cleveland No. 3 as they could; indeed, they put forth special efforts to obtain greater quantities of this quality from their furnaces than ever

before, using extra coke to get it, as they could well afford to do. The manager, therefore, who found his furnaces producing more of the inferior qualities than usual had not a happy time. Makers could secure shillings a ton more for No. 3 than for the lower qualities, and could sell all they could offer; whereas it was difficult to dispose of the lower qualities.

The makers profited largely by the speculative operations of second hands, for they were paid up to 50 shillings 6 pence per ton for No. 3, whereas the ordinary course of trade would not have brought them more than 45 shillings; in fact, the price of warrants fell to 45 shillings 6 pence directly the "squeeze" was over, declining close upon 10 shillings per ton in a day or two. One curious outcome of the demand for Cleveland iron for storing purposes was that a cargo of iron that had been sent from the Tees to Scotland for consumption there was reshipped to Middlesbrough and put into Connal's, thus affording the only instance of Cleveland importing Cleveland iron.

The Great Increase in Stocks.

The rapidity with which the stocks of Cleveland pig iron have increased in Connal's in the last year is shown by the following tables, giving the quantity held at the close of each month, and indicating the increase over the preceding month:

Stocks, Increase.			Stocks, Increase.		
1904.	Tons.	Tons.	1905.	Tons.	Tons.
July	79,322	....	January	237,594	45,767
August	87,576	8,254	February	279,271	41,677
September ...	94,889	7,313	March	335,442	56,171
October	115,028	20,139	April	397,245	61,803
November ...	149,600	34,572	May	487,450	90,205
December ...	191,827	42,227	June	507,839	20,389
			July	538,476	30,637

Thus between the beginning of October, when the gamble was fully set going, and the end of July 543,587 tons of Cleveland iron were added to Connal's stock, and the latter is now nearly double the greatest quantity ever held prior to the current year. It will be noted that the increase has gone on since the corner terminated in May, but at a much reduced rate. This is due to the fact that the syndicate which was cornering the bears, and into whose hands almost all the 487,450 tons reported at May 31 had been delivered, has had to take all the iron that has subsequently been sent in. It has determined that warrants should not go below 45 shillings 6 pence, as it could not afford to sell at less, and to keep warrants at that figure or above it has had to get possession of all the warrants that have since been offered.

The Syndicate's Position Getting Troublesome.

Makers' iron has always been the cheaper of late, and people have bought it and made warrants of it, which warrants the syndicate has had to buy at the market price of the day, otherwise they would be offered at less in other quarters and the price would be weakened. That being so the stock has gone on increasing, and the position is rendered more difficult for the syndicate each month. Of course consumers will not buy the warrants in any quantity when they can get makers' iron at so much less, and the producers are determined that whatever business there is shall fall to their share. Trade is not good enough to take all the iron that is being made and also allow of any reduction of the stock in the public stores. Producers by offering iron cheaper than the figure asked for warrants secure the business and the speculators have simply to stick to their enormous stock of warrants.

It must be remembered that the longer the syndicate keeps the iron in the public warrant stores the more costly it will be, for each month at least 3 pence per ton will be added to the price as the expense of holding it. There is the rent to be paid to Connal's and the interest charged by the banks for the monetary accommodation. Connal's scrip for the iron can be lodged with bankers in Scotland at any rate and the latter will advance up to within 5 shillings per ton of the current market, the margin being kept at that. Cleveland bankers do not favor business of this kind, and it is believed that during the gamble only one banking firm in the district undertook this class of transaction.

The Unsettlement of Legitimate Business.

The situation is still a very complicated one, and what will be the outcome of it cannot well be predicted. So far the Cleveland ironmasters have done well out of it in regard to the prices which they have secured, but legitimate business with them has fallen off very considerably. Their shipments have declined so much this year that they are worse than in any year since 1892, because consumers could not afford to pay the prices which producers quoted. Iron founders have lost a good deal of work, as they had to tender at higher rates to cover the increased cost of pig iron, and competitors in other districts who had not that disadvantage with which to contend secured the orders. It is many years since the iron founders had such a poor time, and all because the high quotations for materials took much of their trade from them.

Merchants who have long done a trade with Continental consumers have lost their connection to some extent because their customers, finding cheaper pig iron obtainable from other quarters, have given Cleveland iron a wide berth, and it may be a difficult task to regain the custom when the difference in prices disappears, for then consumers may have found that the other iron suits their purposes quite as well as Cleveland. Lincolnshire pig iron, which prior to this year was scarcely ever required by the Scotch founders, has been taken freely by them this year, as it was so much cheaper than Cleveland and answered equally well. Owing to the partial loss of custom from the leading districts at home and abroad the production has been in excess of the requirements, though it might not have been if legitimate trade had regulated the market.

The Heavy Stock of Iron an Incubus.

Such a stock as is now held in the public stores as the outcome of the gamble in pig iron is an incubus which will not easily be got rid of, and must influence the market for a long time to come unless there springs up a revival of trade much more pronounced than that to which present indications point. None of the syndicate ever expected that such a stock of warrants as over 500,000 tons could have been accumulated in so short a time, and it would not have been if the makers had not practically come to the rescue of those who were cornered, not from philanthropic motives, be it said, but because of the high prices which those offered who were in difficulties.

Furthermore, it is rather a surprise that the syndicate holds so long and so firmly to the enormous quantity of Cleveland iron which has come into its hands, but has not yet given up the hope that there will arise before long a heavy demand from America, and the improvement in trade at home is another circumstance in its favor. It is true that Cleveland is doing more with America, and has sent over 30,000 tons of pig iron this year, but not much ordinary Cleveland is among this, for it is hematite and other special pigs that are wanted. Two cargoes of Cleveland iron have this year been sent, but that is to be manufactured into pipes which will be exported from the United States, and thus practically the 16 shillings 8 pence per ton duty is not paid on the pig iron imported. Otherwise Cleveland iron could not compete with American iron in the United States.

Notwithstanding the drawbacks the syndicate which holds the warrants has got the prices up 3 shillings 3 pence from the lowest to which they fell after the termination of the corner in May, which was hardly to be expected when stocks have continued to increase. Whether it will come out favorably for itself in the end is a question that time alone can determine.

The United Sheet & Tin Plate Company, Marietta, Ohio, advises us that all matters pertaining to its business have been adjusted and that its plant in Marietta will be started in a short time. The company has spent a large amount of money installing new machinery and introducing other improvements to make this plant strictly modern. An office has been opened in the Diamond Bank Building, Pittsburgh, in charge of D. A. Garden, general manager.

Open Hearth Furnace Comparisons.

BY A. D. WILLIAMS, JR.

The proportions of open hearth furnaces are usually arrived at by an empirical ratio with their normal capacity in tons of steel produced per heat. While it would be feasible to construct rational formulas for proportioning the various parts of the furnace the labor involved in using such formulas would consume a great deal of time and the results would be no more accurate than those arrived at by the empirical ratios used. Past experience alone will enable the designer to predict fuel consumption and output within limits when the furnace is used for the line of work for which it was designed, but radical changes in the charge and the method of working will produce corresponding changes in the output and fuel consumption.

Improvements Came Slowly.

For a long time furnaces were built without any consideration of the local conditions. A furnace was merely an assemblage of brick and buckstays. In many cases an ill-considered design was copied by the aid of a bricklayer, and while such a furnace turned out steel the fuel consumption was high, as were the other expenses of operation. The modern furnace builders are studying the problems to be met, stimulated to a degree by the progress made in this line abroad, particularly in Germany, where small plants are the rule and rapid production is sought after.

One of the first improvements made was in raising the roof of the furnace, thereby increasing the size of the combustion chamber and utilizing the radiant heat of the flame and at the same time reducing the tendency of the roof to collapse at unpropitious moments. The low roof sloping downward toward the center of the hearth was designed to throw the flame directly upon the charge, but it left very little room for the flame at the beginning of a heat, and the natural result followed, which was that the roof cut rapidly and ultimately collapsed. Additional material added to the outside of the roof did not help matters, and, finally, the lesson was learned that a thin roof with a sufficient amount of room beneath it to pass the flame not only lasted longer but improved the action of the furnace.

Furnace Proportions.

The early furnaces were small, and when the larger size furnaces were designed the proportions used in smaller furnaces were often followed without much consideration being paid to all the elements which should have been considered. The area of the hearth was settled on the basis of a certain number of square feet per ton and its length was made twice the width. The volume of gas burned in a furnace is increased very nearly in direct proportion to its capacity, and an addition to the length is of more value than increased width in that it allows a longer time for the chemical combinations of combustion to occur. The result is that the fuel is used to better advantage and less of it is required. The following table gives the hearth dimensions for a few furnaces and the ratio between hearth area and capacity and the length and width:

No.	Location.	Nominal capacity. Tons.	Length × width. Feet.	Hearth area. Square feet.		Length divided by width.
				Length × width.	Per ton.	
1	Pencoyd	70	30.00 × 9.00	270	3.86	3.33
2	Frodingham	100	32.00 × 12.00	400	4.00	2.67
3	Jones & Laughlin	200	40.00 × 16.00	640	3.20	2.50
4	Fa. Steel Company	50	32.00 × 10.00	320	6.40	3.20
5	Donawitz	30	27.00 × 10.00	270	9.00	2.70
6	Duquesne	50	27.00 × 14.00	378	7.56	1.93
7	Sharon	50	29.00 × 14.50	420	8.40	2.00
8	Ill. Steel Company	35	21.87 × 12.25	267	7.62	1.79
9	Ill. Steel Company	50	32.00 × 14.00	448	8.96	2.29
10	Wellman-Seaver	50	33.67 × 13.00	438	8.76	2.59
11	Wellman-Seaver	25	25.00 × 10.50	262	10.50	2.38
12	Shoenberger	35	24.00 × 12.00	288	8.23	2.00
13	Rechtitz	10	13.50 × 7.54	101	10.12	1.82
14	Barrow	50	28.00 × 10.25	287	5.74	2.73
15	Unknown	50	29.00 × 15.00	435	8.70	1.93
16	Laughlin	50	30.00 × 15.00	450	9.00	2.00
17	Homestead	40	26.33 × 12.50	329	8.23	2.11
18	Pottsville	40	24.00 × 12.00	288	7.20	2.00

The first three furnaces are used for the Talbot process.

ess. No. 17, the Homestead furnace, is used for the Monell process. The widths given for Nos. 3 and 4 are the average widths, these furnaces being wider at the middle of the hearth and tapering toward both ends.

A cubic foot of molten steel weighs 430 pounds and a ton occupies about 5.25 cubic feet. From this it can be seen that the average depth of the bath in the above furnaces will be from 6 to 20 inches. In the Barrow furnace, No. 14, the depth of the bath averages about 13 inches and the maximum depth is 26 inches.

Omitting the first three furnaces, which were designed for the Talbot process, in which a deep bath is necessary and only a fraction of the contents of the furnace are drawn off at a time, the above table can be summarized as follows:

Square feet of hearth per ton....	Maximum.....	10.50
	Minimum.....	5.74
	Average.....	8.29
Ratio of hearth length to width..	Maximum.....	3.20
	Minimum.....	1.79
	Average.....	2.23

Most of the American furnaces run under 15 heats per week of approximately 135 hours. Occasionally as many as 23 heats have been made, but such records are exceptional and not sustained. In Europe furnaces making 23 heats per week do so in regular practice and keep it up, but according to American standards these furnaces are operated under their capacity—that is, there is a great deal more furnace used to produce a ton of steel.

A Limit to the Width.

In building open hearth furnaces there is a limit to the width of hearth practicable, owing to the limit to the strength of the skew backs and the arch brick adjacent. It is also more trouble to make and patch the bottom in a wide furnace than it is in a narrow one. A long furnace with the usual arrangement means a considerable addition to the length of the building required to house the plant. The building is usually designed to suit a certain furnace, and radical changes in an existing plant are difficult to make owing to the surroundings, building columns, &c.

Proportioning the Regenerator Capacity.

While the hearth area has a certain effect on the rapidity with which the furnace works, the regenerator capacity must be so proportioned that the gas and air are at a proper heat on reaching the ports so that they will combine without withdrawing heat from the furnace. The height is really the most important of the checker dimensions, as when the volume is the same the higher checker will give better results than the lower. A great many open hearth plants are built on the banks of rivers, where the general level of the plant is too close to the ground water line to permit of the construction of vertical checkers, and the horizontal system, which is not desirable, has been used.

The following table gives the dimensions of the portion of the regenerator chamber occupied by the checker brick in a few of the furnaces cited in the preceding table. The number refers to the preceding table, and the capacity of the furnace has been repeated to avoid referring back:

No.	Tons.	Length × width × height.	Area, square feet.	Volume, cubic feet.	Air, tons.	Gas, tons.
			Area divided by square.	Volume divided by cubic.	Air divided by tons.	Gas divided by tons.
6	50	Air, 12.00 × 10.00 × 9.00	220	4.40	1,980	39.80
		Gas, 22.00 × 6.00 × 9.00	132	2.64	1,188	23.78
			352	7.04	3,168	63.58
8	35	Air, 12.17 × 8.33 × 8.50	101	2.89	859	24.60
		Gas, 12.17 × 6.33 × 8.50	77	2.20	655	18.72
			178	5.09	1,514	43.32
9	50	Air, 22.00 × 10.83 × 10.50	238	4.76	2,499	49.98
		Gas, 22.00 × 7.92 × 10.50	174	3.48	1,827	36.54
			412	8.24	4,326	86.52
10	50	Air, 23.50 × 8.00 × 10.00	188	3.76	1,880	37.60
		Gas, 23.50 × 5.50 × 10.00	129	2.58	1,290	25.80
			317	6.34	3,170	63.40
11	25	Air, 18.00 × 6.00 × 8.50	108	4.32	918	36.72
		Gas, 18.00 × 4.50 × 8.50	81	3.24	688	27.52
			189	7.56	1,606	64.24

14	50	Air, 12.25 × 9.50 × 9.25	116	2.32	1,075	20.15
			Gas, 12.25 × 9.50 × 9.25	116	2.32	1,075 20.15
				232	4.64	2,150 40.30 1.00
15	50	Air, 18.00 × 12.00 × 14.50	216	4.32	3,132	62.64
			Gas, 18.00 × 8.00 × 14.50	144	2.88	2,068 41.36
				360	7.20	5,200 104.00 1.52
16	50	Air, 18.17 × 12.08 × 14.00	219	4.38	3,066	61.32
			Gas, 18.17 × 10.08 × 14.00	183	3.66	2,562 51.24
				402	8.04	5,628 112.56 1.195

For each furnace the third line gives the ratio for the combined sum of the gas and air regenerators. No. 6 is fired with natural gas, but is arranged to use producer gas if necessary. Nos. 8, 9, 10, 11 and 14 are fired with producer gas. Furnace No. 16 somewhat closely approaches foreign practice both in its regenerators and hearth.

In some foreign furnaces the total volume of the regenerators is 4 cubic meters, or 140 cubic feet, per ton, half of which is in the gas and half in the air checkers. A more usual method is to make the air regenerators 10 per cent. greater in volume than the gas regenerators, giving 74 cubic feet to the air and 67 cubic feet to the gas checkers per ton, and in a few cases even larger regenerators are in use. Another ratio used abroad is to allow from 110 to 155 pounds of checker brick per pound of coal burned in the producers per ton of steel. One brick weighs 7.33 pounds, and when set $3\frac{1}{2}$ inches apart, which is the usual gauge for checker brick, the above ratio would mean a checker volume of 105 to 150 cubic feet per ton, with a fuel consumption of 500 pounds of coal to be divided between the gas and the air.

In modern furnaces the regenerators are placed beneath the charging platform and a good sized cinder pocket is provided, which catches the cinder carried over and prevents the checkers from becoming bunged up and destroyed. The early furnaces were supported on the regenerator casings and a great deal of trouble was due to such construction, as this brick work was continually expanding and contracting, racking the pan and causing cracks in the bottom. Fortunately in most cases these cracks amounted to little, but whenever it was necessary to rip out an old bottom it was found full of threads of steel, which in many cases had reached the pan and chilled there without causing a run out. Modern furnaces are supported independently of the flues leading to them, steel columns and beams being used, upon which the pan rests, or in some cases a solid mass of brick and concrete is used without a pan.

The Krupp Works.

The Krupp Works, which became the undivided property of his daughter, Bertha Krupp, upon the death of Friedrich Alfred Krupp, was converted into a stock company with a capital of 16,000,000 marks. The total issue of the capital, however, is in the possession of his daughter. The directorate of the company consists of 11 persons, nine of whom reside at Essen, one at Magdeburg and one at Kiel, the last two representatives of the Gruson Works and the Germania Shipyard. The Executive Committee consists of four persons.

The Friedrich Krupp Aktiengesellschaft employs altogether 55,816 people, inclusive of 4632 officials, and owns the following plants: The steel works at Essen, employing 46,587 persons; the steel works at Annen, employing 840 people; the Gruson Works at Magdeburg-Buckau, employing 3938 persons, and the Germania Shipyard at Kiel, employing 4451 men.

The administration of the steel works at Essen includes the proving grounds at Meppen and at Tangerhütte, the Saelzer-Neuack collieries at Essen, the Hanover colliery at Hordel, near Bochum; the Hannibal colliery at Hordel-Eickel, near Bochum; numerous iron mines in Germany and Northern Spain, the Friedrich Alfred Works at Rheinhausen, the Muelhofen Works at Engers, the Hermann Works at Neuwied, the machine shop and foundry at Sayn and docks at Rotterdam.

At the Essen Works a wide variety of steel is made, including crucible, open hearth, steel castings, puddled steel, Bessemer, special steel for crushing machinery, dredges and safes, special steels for automobiles and a

variety of alloys with tungsten, nickel, chrome, molybdenum, &c. Besides these the works makes iron castings, forgings and bronze. The principal specialty of the Essen Works as well as the Gruson Works and the Germania Shipyard is the manufacture of war material, including guns of all calibers and armor. The works produces also material for railroads, ships, machines, plates, rolls and tool steel. In 1904 there were in operation 5700 machine tools, 153 steel hammers, with a total weight of tup of 250,223 tons; 66 hydraulic presses, 373 boilers, 514 steam engines, with an aggregate horsepower of 44,111; 569 dynamos, with an aggregate horsepower of 8219; 608 cranes, with a total carrying capacity of 6513 tons. The total consumption of coal was 873,916 tons; of coke, 454,521 tons; of briquettes, 877 tons; of gas, 17,500,000 c. m., and of electricity, 9,974,795 kw. hours. At the two proving grounds 31,876 shots were fired during 1904, with a consumption of 75 tons of powder and 526 tons of projectiles.

Of all the iron works, however, the most important from a modern point of view is the Friedrich Alfred plant at Rheinhausen, on the left bank of the Rhine, opposite Duisburg-Hochfeld. It includes six blast furnaces, a steel plant, with two 30-ton open hearth furnaces; a basic Bessemer works, with four 20-ton converters and two 500-ton mixers. The rolling mill includes a two-high reversing blooming mill, with 45.27-inch rolls; a reversing two-high mill of 33.5-inch rolls driven by an engine, on the other side of which is a 33.5-inch three-high mill, and contains also a 27.5-inch three-high, a 20.6-inch three-high and a 15.5-inch three-high mill, with gas engine, and a double reversing mill, with 11.8-inch rolls driven by a gas engine. The total plant is supplied by an electrical central station, with six 5000 horse-power dynamos driven by blast furnace engines, two vertical compound engines of 200 horse-power each, a furnace gas engine of 40 horse-power and 74 boilers.

The Annen Steel Works has three open hearth furnaces with an aggregate capacity of 40 tons, two crucible furnaces with 100 crucibles each, four heating furnaces and a new rolling mill. This plant makes as a specialty open hearth and crucible steel castings, gun barrel steel and steel for other gun parts. The plant has a capacity for making 25-ton castings.

The principal products of the Gruson Works are cast iron forts and other war material, chilled rolls and castings of all kinds, gray iron and steel castings, forgings, cranes, rolling mills and crushing and concentrating machinery. Besides these the works produces special machinery for the manufacture of linoleum, for the manufacture of cork products, cable, hemp and wire rope machinery, and rubber, celluloid, powder, oil and oil cake machinery, band saws for cutting metals and plate polishing machines. In 1904 this plant had 1508 machine tools and 379 cranes.

The Germania shipbuilding plant, which became the property of the Krupp Company on April 1, 1902, produces war vessels and merchant ships of all types, ice breakers, dredging machinery and dock machinery, marine and stationary engines, pumping engines, Zoelly steam turbines, mining and steel works machinery, boilers of all types, steel motor cars and motor boats. There are seven slips, four of them covered, for large vessels, and one slip for five to six torpedo boats. In 1904 there were employed 1056 machine tools, 10 steam hammers and 105 cranes.

In 1903 the Krupp Company paid, as demanded by the law, for sick insurance, 631,722 marks; for accident insurance, 984,125 marks, and for invalid insurance, 319,539 marks. The company also paid into workmen's funds not prescribed by law a total of 1,000,089 marks in the year 1903. In the same year there was contributed from special funds and endowments an additional sum of 319,920 marks, so that the total payments by the firm for workmen's insurance, pensions and other contributions footed up to 3,255,396 marks.

The American Shipbuilding Company, Cleveland, Ohio, has recently placed contracts with Pittsburgh mills for plates and shapes for three large lake vessels and has more business pending.

of Pittsburgh and Allegheny County. With the exception of a little charcoal pig iron made about 1793, not a pound was produced in the county until 1859, when the Clinton Furnace was built. It was followed in the 60's by the Ellza, Superior and Shoenberger furnaces, but it was not until the 70's that the real development of the blast furnace industry may be said to have begun. Pittsburgh then astonished the world by driving its furnaces harder than had ever been known and making records of production which caused conservative furnace managers to predict results which would compel a return to old methods. But the men of the new era never faltered or turned back. They built bigger furnaces and drove them as hard and taught the world new lessons in furnace management.

Unfair Commercial Attacks Are Boomerangs.

The last engineering edition of the London *Times* makes the following statement: "For some time an important German shipbuilding firm has been organizing in the German press a campaign against the Parsons marine turbine by inserting false statements as to the comparative performance of the turbine propelled torpedo boats and similar boats fitted with reciprocating engines. The publication of the statements in question having been procured in different press organs, as stated, they have been summarized in an imitation typewritten circular, which appears to have been extensively circulated on the Continent. The Turbinia Deutsche Parsons Marine Actien-Gesellschaft has now published a flat denial of most of the malicious statements and has given the exact facts in those cases in which the statements were merely misleading or grossly exaggerated, without being absolutely without foundation."

We do not presume to judge of the merits of this controversy, but supposing the statement in the *Times* to be true the offense of the German firm is to be censured, both from its lack of appreciation of the moral side of business and because of the lack of good business principles involved when considered from the standpoint of the welfare of the attacking firm. It is a very foolish policy to misrepresent the products of a competitor. It not only does not pay but it hurts the one who misrepresents. The competitor soon learns of it and the customer likewise. The customer then discredits the man who has tried to deceive him. The best method of advancing the interests of a manufacturing establishment is not to belittle the competitor, but to dwell on the strong points of one's own product. Comparisons may not always be odious; they may assist in pointing out the merits of whatever the salesman may be trying to dispose of. But it is always a good rule to presume that the customer is suspicious of the man who tries to make a sale more by comparison with the products of a competitor than by an exposition of the merits of his own. A machine or anything else worth the buying must have good selling qualities of its own.

Assuming that the statement in the *Times* is well founded in fact, the firm which instigated the campaign against the Parsons turbine can have gained nothing more than perhaps a temporary prejudice against the new type of marine engine. Those customers who would make a choice between the turbine and the reciprocating engine are naturally quite deliberate in deciding upon the relative merits of each. Too much is involved in the question as to which would be the better in a given ship, and no newspaper statement of relative efficiency would be taken as final proof when actual results of

tests may be had from official sources. On the other hand, if the false newspaper reports of trials were proved to the customer to have been maliciously inserted for the sake of influencing him and others like him, a new prejudice, reactionary and therefore stronger, would be engendered in favor of the turbine. A reputable newspaper would probably be quick to disown statements which it was misled into publishing. An engineering paper would certainly do so. In the field of steam engineering, as in every other branch of engineering, no new type can be entirely revolutionary. The reciprocating engine has by no means been displaced nor will it be by the turbine. Each has its own field, the limits of which are yet to be defined. The same is true of a new engine lathe or planer or other machine of radical design. In fact, the new usually helps the old by stimulating to more rapid advance in design and efficiency.

In considering the specific instance of the attack on the Parsons turbine, *Engineering* remarks that it is a "notable instance" of the fact that "a portion of the unfortunate ill feeling toward Germany exhibited by an important section of the (English) community has undoubtedly originated in the deplorable business methods adopted by certain, and no doubt a small majority of, German manufacturers." Unquestionably a great deal depends upon a national reputation for business dealings. Any one can easily bring to mind nations which are being injured by the unfortunate methods of a few of their people. American manufacturers and merchants have erred in their dealings in foreign markets, but it may truthfully be said that most of them have seen the fallacy of the old penny-wise pound-foolish policy. Foreigners are prone to class people of the same nation as having uniform business characteristics. If one American has tried sharp business dealings with a foreigner the next American who comes along will be placed in the same general class, no matter how lofty may be his ideas of business honor. If this British attack on the German manufacturers is well grounded, and if they continue to lean toward unfair methods of competition in this or other ways, they themselves will be the sufferers in their loss of national business reputation. We have some doubts, however, as to whether the British point of view is a wholly safe one to take. Flagrant instances of business dishonor are surely as rare in Germany as in any other enlightened nation.

The Situation as to Ferromanganese.

Attention is called to the manganese ore situation by figures showing that during August the imports on the Atlantic seaboard amounted to 23,505 tons, comprising 13,025 tons from British India and 10,480 tons from Brazil, no imports of Russian or Greek ore being shown. It is but a few years ago that the Caucasian manganese ores constituted the chief supply of this country. It can hardly be said that the Indian and Brazilian deposits have been developed to such an extent that the United States can permanently subsist on them alone, yet it is quite significant that last month our imports from these sources were at the rate of 282,000 tons per annum. Our production of ferromanganese in any one year has never exceeded 60,000 tons. For spiegeleisen, of which in one year we made as much as 231,822 tons, some domestic ores can be used, it being the custom to mix them with foreign ores.

There has been a disposition in some quarters in the past few months to infer that the troubles in Russia were likely to give great inconvenience to American con-

sumers of manganese ores. Since the conclusion of peace between Russia and Japan it is reasonable to conclude that serious trouble is less likely to occur. At any rate it is a fact that consumers, having been cognizant right along of the dangers, have followed more carefully than usual their general policy of maintaining a good supply ahead and at the present time are assured of their requirements for the next six months.

An interesting factor enters into the situation, and that is that when there is great pressure for all grades of domestic pig iron the tendency is for manufacturers to curtail their production of ferromanganese in order to use the furnace capacity for the production of ordinary iron. There is a simple economic reason for this. The duty on pig iron is \$4 per ton, irrespective of grade, although ferromanganese is worth in the market from three to four times as much as Bessemer pig iron. At any time when the price of ordinary pig reaches or nearly approaches the importing point an inducement is given to increase importations of ferromanganese and reduce domestic production. Such a condition prevailed in 1902, and production of ferromanganese fell off from 59,639 tons in 1901 to 44,573 tons in 1902, while imports increased from 8,995 tons to 37,618 tons. It is to be presumed that stocks existed which were drawn upon or the increase in imports would have been greater, as consumption necessarily increased. A sharp falling off in domestic production of spiegeleisen occurred in 1902 also, or from 231,822 tons in the preceding year to 168,408 tons.

It can be stated that the leading domestic producer of ferromanganese is at the present time considering the diversion of some blast furnace capacity ordinarily employed on ferromanganese to the manufacture of Bessemer pig, although it is well covered on manganese ores for the next six months, for a maintenance of its regular production. This may have an important bearing on the price of imported metal, which has been growing stronger of late and scored an additional advance last week. It will also have some influence on the Bessemer pig iron situation.

The production of ferromanganese and spiegeleisen in the United States has been as follows:

<i>United States Production.—Gross Tons.</i>		
	Ferro.	Spiegel.
1900.....	48,472	207,505
1901.....	59,639	231,822
1902.....	44,573	168,408
1903.....	35,961	156,700
1904.....	58,022	162,370

The imports in the four fiscal years ending with 1904 are given below. The figures for the year ended June 30, 1905, are not yet available. The figures refer to imports for consumption and not general imports, the distinction being that they include imports directly entered for consumption and withdrawals for warehouse. Statistics of general imports are more commonly given and include entries for warehouse instead of withdrawals.

<i>Imports, Fiscal Years Ended June 30.—Gross Tons.</i>		
	Ferro.	Spiegel.
1901.....	8,995	16,308
1902.....	37,618	31,416
1903.....	53,121	122,566
1904.....	23,903	50,620

The following table gives for fiscal years the tonnage on which drawback has been allowed. The drawback statistics for the fiscal year ended June 30, 1905, will be available in about two months:

<i>Tonnage on Which Drawback Was Allowed, Fiscal Years Ended June 30.</i>		
	Ferro.	Spiegel.
1901.....	60	0
1902.....	67	2,682
1903.....	1	266
1904.....	1,421	2,626

Drawback has not been paid on as much imported ferromanganese and spiegeleisen entering into exported steel as might be expected. The Treasury Department has grown somewhat more liberal in its construction of the drawback feature of the tariff act, which probably accounts for most of the increase shown in the above figures for 1904.

It Is Co-operation, Not Competition.

Last week enlightenment came to the general public about the wonderful harmony—a sort of earthly music of the spheres—that exists in the circles of high finance. This special radiance emanated from the inner shrine, and was therefore pure and unalloyed. It was of dazzling brilliance, and yet tinged with an afflatus that tempered its rays to a weary and waiting world. To apprehend its meaning and appreciate its full significance will demand time, but while its entire benefits can only be absorbed by a long period of assimilation a modicum can be obtained at once by all willing souls.

There is no more competition—it is all co-operation—in the financial centers of humanity where men do congregate in pursuit of the strenuous and oftentimes timid shekel. Bankers have long known this, but being wise in their day and generation have not informed a palpitating world that the lion and the lamb were ready to lie down and sleep together, and yet separately, and not one in the midst of the other. Now, therefore, "Ye who listen with credulity to the whispers of fancy and pursue with eagerness the phantoms of hope," attend to the story of George W. Perkins, vice-president of the New York Life Insurance Company and member of the firm of J. P. Morgan & Co. In his testimony before the State Investigating Committee Mr. Perkins said:

The old idea that competition is the life of trade is an exploded idea. Competition is no longer the life of trade; it is co-operation. And whether it is co-operation between you gentlemen for the purpose of the reformation and perfecting of the laws, or between the policy holders of the New York Life Insurance Company for their own benefit, or Mr. Vanderbilt, who carries a million dollars of insurance, or any one of these gentlemen here, or anywhere, that carries a thousand dollars of insurance, the money all comes into one great treasury and is handled for the benefit of everybody, and that is the syndicate.

Beautiful thought and convenient combination! Mr. Perkins, the insurance man, invests the millions of surplus of his company with Mr. Perkins the banker; everybody makes a profit and everybody ought to be happy. Money comes to the insurance company from the policy holder, then passes to the banker and is invested in schemes of his own. If the schemes fail, the insurance company and its policy holders lose, the banker being safe, no matter which way the cat jumps. This is co-operation in investment, but not in results.

Carry the plan in other directions and imagine any industry conducted upon a strictly mutual outline, in which rivalry is forgotten in the good accruing to all. Such a state would disjoint half our economic laws and compel us to take to school again. But the trouble is that in trade we have not the same factors to deal with as in insurance; in the first there is no plethora of funds to serve as an earning power; the owner is generally in the market as a borrower.

And yet we are rejoiced to have light shed upon us. There is no competition. In the dark and private recesses there is only co-operation. The little dealer, on the quiet, works for the benefit of his neighbor, but in the broad sunlight of the open he does him if he can. Standard Oil means co-operation. The fear of competition is not the true reason for absorbing the small producer; he is brought into the fold, that he may see the error of his ways and, incidentally, share in the profits

of co-operation. When we examine it closely we discover that it is a benevolent organization conducted along philanthropic lines for the greatest good.

Mr. Perkins has added a catchy phrase, and that is the alpha and omega of his testimony; he has also displayed a text from and upon which will flow homilies revealing "deep thought and rare erudition."

OBITUARY.

JAMES CHAPMAN, who established the Fulton Iron Works, Los Angeles, Cal., died in that city September 5, from paralysis, aged 62 years. He was a native of Scotland. For the past 20 years he resided in Los Angeles, and was active in every movement for the advancement of the city. He leaves a widow and seven children.

JOHN A. WILEY, president of the Davis & Furber Machine Company, North Andover, Mass., died September 1, aged 80 years. He was born in South Reading, now Wakefield, Mass., and at the age of 14 was apprenticed to learn the carriage building trade, becoming a skillful workman. In 1845 he took a position with Gleason & Dow, now the Davis & Furber Machine Company. His ability was recognized and he became a member of the firm of Davis, Gleason & Furber. After nine years he became a member of the firm of Davis & Furber on January 1, 1858. He was a prodigious worker, and his marked ability, tact and resourcefulness made him a prominent factor in the firm, to which he gave much devoted service. When the Davis & Furber Machine Company was incorporated in 1883 Mr. Wiley was chosen president of the company. In 1891 he was elected treasurer, which office he held for four years, and then resigned. After his resignation Mr. Wiley was again elected president. He served as a member of the State Senate in 1880-1881 after one year's previous term in the House of Representatives. He was a director in the Pacific National Bank, the Rea Cattle Company and the Concord Cattle Company.

JACOB NORTH, long identified with American copper and iron mining, died at Pittsfield, Mass., September 15. He was born in Leicester, England, in 1812, and came to this country in 1843. He opened a copper mine at Flemington, N. J., which proved a successful venture. In 1862 he was engaged by Robert Pomeroy of Pittsfield, Mass., to open iron mines at Richmond and Stockbridge, Mass. In the 70's he was manager of the Colby Iron Works at Lanesboro. His name was prominently associated with the development of the New England iron mining industry, of which much was expected, but which was outclassed in competition with better fields.

ROBERT M. HASELTINE, for 12 years State Inspector of Mines in Ohio, died recently. The funeral was held at Youngstown, Ohio, on September 14. Since he retired from the official position he held under four State administrations Mr. Haseltine had practiced as a consulting engineer, with offices at Columbus, Ohio.

The Patent Office.—According to the annual report of the Commissioner of Patents, the receipts for the fiscal year ended June 30 last were \$1,737,344, and the expenditures \$1,472,467, the surplus being turned into the Treasury. The business of last year is said to have been the largest for any single year. The report shows the following operations for the year: There were 52,323 applications for mechanical patents, 749 applications for designs, 174 applications for trademarks, 1236 applications for labels and 448 applications for prints. There were 30,266 patents granted, including reissues and designs, and 1426 trademarks, 1028 labels and 345 prints were registered. The number of patents that expired was 19,567. The number of allowed applications which were by operation of law forfeited for nonpayment of the final fees was 5154.

The insufficiency of rolling stock of Russian railroads is so great that it is said that the Government contemplates giving permission to buy foreign cars and locomotives.

Iron and Industrial Stocks.

NEW YORK, September 20, 1905.

The stock market is still under the influence of the money market, and transactions are limited. It will probably be several weeks until financial interests feel thoroughly comfortable, as the movement of crops is taking considerable more money than had been anticipated. While quite a number of the leading industrial stocks have shown narrow fluctuations during the week, a few have advanced considerably under the stimulus of excellent reports of increasing business. Locomotive common moved up from 49½ on Thursday to 54¾ on Tuesday. Pressed Steel common also showed an advance during the week from 43¾ to 46. Republic common advanced from 21 to 24½, and the preferred from 90½ to 95½. Tennessee Coal was also strong, moving up from 85¼ to 87½. Last transactions, up to 1.30 p.m. to-day, are reported at the following prices: Can common 11¼, preferred 70¾; Car & Foundry common 36¾, preferred 100; Locomotive common, 53¾, preferred 114¾; Steel Foundries common 8¾, preferred 39; Colorado Fuel 44¾; Pressed Steel common 45¾, preferred 96; Railway Spring common 37¾, preferred 99¾; Republic common 24¾, preferred 94½; Sloss-Sheffield common 70½, preferred 107; Tennessee Coal 88; United States Steel common 37¾, preferred 104½.

The Westinghouse Air Brake Company.—This company has issued an abstract of the financial statement for the year ending July 31, 1905, which shows a great increase in the sales and net earnings of the company over those of last year. Dividends of over \$2,000,000 have been paid, which leaves a balance to the credit of the general profit and loss account of nearly \$800,000. The annual meeting will be held October 3. The income account, showing comparison with last year, is as follows:

	1905.	1904.
Total income.....	\$7,958,568	\$5,939,953
Expenses	*4,999,789	3,575,772
Net.....	\$2,958,779	\$2,364,181
Charged off and special depreciation fund		26,022
Surplus.....	\$2,958,779	\$2,338,159
Dividends	2,198,215	2,417,899
Surplus.....	\$760,564	†\$79,740

* Includes depreciation. † Deficit.

Dividends.—American Iron & Steel Mfg. Company has declared a dividend of 1 per cent. on the common stock and the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable October 2.

American Locomotive Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable October 21.

General Electric Company has declared a quarterly dividend of 2 per cent. payable October 2.

Westinghouse Air Brake Company has declared a quarterly dividend of 2½ per cent. and an extra dividend of 2½ per cent., payable October 10.

The American Smelting & Refining Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable October 2, and 1¼ per cent. on the common stock, payable October 16. This is an increase of ½ per cent. quarterly on the common stock, or 2 per cent. per year, and puts the issue on a 7 per cent. basis.

Vulcan Detinning Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable October 20.

American Shipbuilding Company has declared a dividend of 1¼ per cent., payable October 15.

International Power Company has declared the regular semiannual dividend of 3 per cent. on the preferred stock and an additional dividend of 1 per cent., both payable October 2. The regular quarterly dividend of 1 per cent. on the common stock has also been declared, payable October 2.

American Screw Company has declared a quarterly dividend of 1½ per cent. and an extra dividend of ½ per cent., payable September 30.

Central Coal & Coke Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock and 1½ per cent. on the common stock, both payable October 15.

United Shoe Machinery Company has declared a dividend of 1½ per cent. on the preferred stock and 2 per cent. on the common stock, payable October 14.

Tennessee Coal, Iron & Railroad Company has declared the regular quarterly dividend of 2 per cent. on the preferred stock and 1 per cent. on the common stock, payable November 1.

The German producers of wire nails have under consideration the establishment of a new syndicate until the end of 1907. Meantime a few large works that have formed an association are practically monopolizing the export trade. An attempt is also being made to form a syndicate in bars, but so far without success.

Canadian Industrial Developments.

Electric Smelting Prospects.

TORONTO, September 16, 1905.—Dr. P. L. T. Heroult, Technical Director of the Electro Metallurgical Society, La Praz, France, is now in Canada. His business on this side of the Atlantic appears to have to do largely with the installation of his process of steel making by electricity at Syracuse, N. Y. There, it seems, the Halcomb Steel Company, which is said to have obtained the right to use his method, is building a plant for the production of high-grade billets as material for the manufacture of tools, piano rods and other special lines. The steel is to be produced by the ordinary process, but will be purified by the Heroult electrical treatment.

In Canada Dr. Heroult will spend some time superintending the construction at Sault Ste. Marie of a plant for the manufacture of pig iron and steel by his electrical process. The Lake Superior Corporation places a certain amount of electrical power at the disposal of Dr. Heroult for making the test. On the recommendation of the Minister of the Interior Parliament voted \$15,000 in aid of the experiment. One of the officials of the Interior Department, Dr. Haanel, Superintendent of Mines, is to watch operations at the plant for the Government. It was upon Dr. Haanel's advice that the late Minister of the Interior sent a commission to Europe to study the working of processes for the electric smelting of iron and manufacture of steel, Dr. Haanel himself being the commissioner.

It remains to be seen how far the expectations of Dr. Haanel and Dr. Heroult will be realized in this country. That these expectations are high is apparent, first, from the language of the commissioner's report, and, second, from the terms of Dr. Heroult's prediction this week in Ottawa. He is credited by the Ottawa correspondent of the *Toronto Globe* with the following forecast:

In ten years Canada will have become a great metallurgical country. You will see an iron industry in this Dominion larger than in any other country in the world. Canada will yet furnish to the world its iron supply. It will be just the same with iron as with wheat. A decade from now Canada will outstrip all other countries in wheat growing. The production of iron at a cheaper rate than it can be made elsewhere will cause Canada to take a similar position as far as iron is concerned.

He entertains the expectation, according to the *Globe's* correspondent, that under favorable conditions pig iron can be produced in Ontario at a cost of \$10 a ton, and steel at an additional expense of \$4 per ton. It appears that Dr. Heroult has undertaken to reimburse the Government the \$15,000 by the proceeds of the sale in Canada of licenses for the use of his process.

Examination of Zinc Deposits.

Dr. Heroult is not the only specialist brought into Canada by the Dominion Superintendent of Mines to assist in starting the development of mineral resources. P. Argall, whose work in Colorado, Arizona and New Mexico has earned him the reputation of an expert in matters relating to zinc deposits, has been brought from the United States to take a place on a commission that has been appointed to study the zinc prospects of Kootenay district in British Columbia. He and A. C. Garde will do the field work of the commission, and on the data they collect W. R. Ingalls will prepare a report. Mr. Garde is experienced in the mining and treating of zinc in the Slocan mining district of British Columbia. Mr. Argall and he will collect samples of zinc ore, representing all kinds, and shipments will be sent to Denver to be treated there under Mr. Argall's supervision. Of the results the public can hear nothing until the final report is issued by Mr. Ingalls.

French Inquirers.

Albert de Romeu, Paris, and Adolphe Chalas of the same city and of London, England, have been making careful examinations of the known mineral areas of Ontario. M. de Romeu is here in the capacity of a commissioner of the French Government to investigate the field for certain minerals. M. Chalas, who has had a large experience in the nickel mines of New Caledonia, is also carrying on his inquiries as a representative of French interests. They spent ten days in Cobalt. They also visited Sudbury, Sault Ste. Marie, the corundum district in Renfrew County and the mica deposits in

the eastern part of the province. M. de Romeu leaves New York for France on the 24th. M. Chalas will look over the mineral tracts of part of British Columbia before going home.

Rails for the Grand Trunk Pacific.

On Monday the first sod of the Lake Superior branch of the National Transcontinental Railway was formally turned at Fort William by Sir Wilfrid Laurier. This ceremony, according to the statement of F. W. Morse, general manager of the Grand Trunk Pacific Railway Company, is to be followed with all possible dispatch by construction operations, these to be pushed rapidly on until the line is finished. For the building of this branch the company has secured assistance from the Province of Ontario. In the session of 1904 the Provincial Legislature passed an act which authorized the Provincial Government to hand over to the company a cash subsidy of \$2000 and a land subsidy of 6000 acres for every mile of the branch constructed. As the branch is to be 200 miles long this grant will amount to \$400,000 cash and 1,200,000 acres of land. The lands in question are to be in alternate blocks, any one of which is not to exceed 69,120 acres in extent and not to be less than 23,000 acres. The blocks are to adjoin the track and are not to extend more than 18 miles in one direction or the other from the track.

But one of the conditions on which this liberal grant holds is that the rails used must be made in Ontario, or if not obtainable in Ontario then they must be the product of mills in some other province of the Dominion. There is a stipulation as to the price. The company shall not be required to pay more for the rails than rails of similar make and quality are selling for in Great Britain or the United States, plus the freight to the point of delivery. Since this Ontario act was passed the Dominion Government has placed a duty on rails coming into Canada, thus strengthening the grip of home manufacturers upon the order. Of 85-pound rails it will require about 30,000 tons to make the direct track, to say nothing of yards and sidings. The yards at Fort William will doubtless take up scores of miles, for this is to be the upper lake terminal of the National Transcontinental system. Ultimately the branch may have to be double tracked, as is the case with the section of the Canadian Pacific Railroad from Winnipeg to Fort William. For all the rails Ontario mills are to have the preference, and Ontario mills now mean those of the Algoma Steel Company at Sault Ste. Marie.

Bounties.

There are now 14 iron and steel making companies with which ledger accounts are kept with the Department of Trade and Commerce at Ottawa. The names of these companies, with the total amount which each has received in bounties during the last seven years—1898-1905—are given in the following table:

Nova Scotia Steel Company.....	\$276,278
Nova Scotia Steel & Coal Company, Limited.....	596,693
Mineral P. Company, Pictou, N. S.....	7,378
Dominion Iron & Steel Company, Limited.....	2,252,455
Canada Iron Furnace Company.....	447,657
Ontario Rolling Mills Company.....	18,712
Hamilton Blast Furnace Company.....	203,080
Hamilton Steel & Iron Company, Limited.....	846,144
Deseronto Iron Company.....	133,134
John McDougall & Co.....	26,204
Electric Reduction Company.....	2,222
Algoma Steel Company, Limited.....	328,740
Londonderry Iron & Mining Company.....	64,493
Montreal Rolling Mills.....	1,545
Total.....	\$5,204,755

Buying Steel Rails Abroad.

Two Canadian contracts for rails have recently been placed in the United Kingdom, one for 8000 and the other for 15,000 tons. The larger will be delivered at Vancouver, carried by water. The Grand Trunk Pacific has been making inquiries on the Scotch market as to prices for the delivery of 30,000 tons. British sellers are taking much more interest in this market since the rail bounty was canceled. For the double tracking of the Canadian Pacific Railroad from Winnipeg to Fort William, which has just been commenced, rails have to be purchased, as well as for the construction of the Toronto-Sudbury branch, which will soon be ready for the steel

C. A. C. J.

NEWS OF THE WORKS.

Iron and Steel.

Vollkommer & Co., engineers and contractors, Empire Building, Pittsburgh, have recently completed an extension to the open hearth building of the Allegheny Steel Company, at Brackenridge, Pa., and have under way the erection of a building that will contain the plate mill of the same concern. Among other contracts this concern has is one calling for a steel structure in which pipe mills are to be installed, also a steel building for the Star Enameling & Stamping Company, at McKees Rocks, Pa., 72 x 160 feet. Several steel water towers will also be built by this company. The concern also has a number of inquiries regarding its method of applying enamel mechanically to stamped ware and has orders for the installation of several of its appliances for doing this work.

The buildings of the new crucible steel plant of the Halcomb Steel Company at Syracuse, N. Y., are rapidly nearing completion and the bulk of the equipment is in position. The company expects to be ready for operation in the latter part of the year.

The Wallingford Metal Company, Wallingford, Conn., will erect a rolling mill.

The Tennessee Coal, Iron & Railroad Company has blown in its Oxmoor Furnace, making two furnaces blown in during the last two weeks. The company will blow in another furnace at Bessemer in the next week or ten days. The Tennessee Company now has four furnaces manufacturing basic iron at Ensley and five furnaces producing foundry iron.

The Shenango Furnace Company, Frick Building, Pittsburgh, is making some extensive improvements and additions to equipment of its No. 4 blast furnace, at Sharpsville, Pa. The stack has been raised, the hearth enlarged and two Allis-Chalmers blowing engines have been installed. Four new Massicks and Crooke's hot blast stoves, built by G. W. McClure, Son & Co., Bessemer Building, Pittsburgh, have been added. These improvements and additions will enable this furnace to make 450 tons of iron per day, while the other three stacks are good for 250 tons a day each, or a total of 1200 tons to the four stacks, making the Shenango Furnace Company the largest independent producer of pig iron in the two Valleys. No. 4 stack is expected to be ready for blast about October 1, and when it resumes operation No. 3 will be blown out and enlarged to make it a twin stack of No. 4. An Allis-Chalmers engine has also been added to Nos. 1 and 2 furnaces, considerably increasing their output.

The United States Sheet & Tin Plate Company has made plans which will materially affect the operation of its mills, at Marietta, Newark and Newcomerstown, Ohio, as well as the new plant being built at Byesville, Ohio. The plant at Newark is to be abandoned and the machinery moved to the Newcomerstown mills.

E. W. Cook and H. C. Rockhill have been appointed receivers of the Ft. Wayne Iron & Steel Company, Ft. Wayne, Ind., on petition of the Ft. Wayne Electrical Works, the Menefee Foundry Company and the Holton Mfg. Company, for involuntary bankruptcy. The company, through its attorney, promptly filed a cross petition for the appointment of temporary receivers. The company had offered 50 cents on the dollar, which the creditors had decided to accept, but afterward reconsidered until after an investigation of the books. The company then withdrew its compromise offer.

General Machinery.

The Standard Connecting Rod Company, Beaver Falls, Pa., maker of finished connecting rods, cranks, shafts, &c., is building a large addition to its plant.

Receivers for the Indianapolis Drop Forging Company, Indianapolis, Ind., report to the court that the company is now in fairly prosperous condition and will soon be self supporting. The plant was partially destroyed by fire in July, 1904. Insurance obtained was \$22,871, and \$20,000 was borrowed. Of the latter amount \$14,387 was used for rebuilding and equipping the part of the plant damaged and debts of \$25,525 were paid. The rehabilitated plant has been running since January. There are \$18,000 at present in unfilled orders. The court has authorized the receivers to borrow \$15,000.

The Howard Iron Works, Buffalo, N. Y., manufacturer of elevators and bolt making machinery, has increased its capital stock from \$50,000 to \$200,000.

The Link-Belt Machinery Company, Chicago, has increased the number of its directors from five to seven, the new directors being Dyke Williams and S. B. Peck.

The Henry Vogt Machine Company, Louisville, Ky., has taken the following contracts recently: S. C. Campbell, St. Louis, Mo., 15-ton ice making plant; Pineville Electric Light, Power & Ice Company, Pineville, Ky., 30-ton refrigerating machine; refrigerating plant in the Weissinger-Gaubert apartment building, Louisville; Ed. Stallings, Americus, Ga., 60-ton refrigerating machine, to be located at Cordele, Ga.; Wonham & Magor, New York City, 5-ton ice making machine, to be shipped to Cuba.

The Kaufman Metal Company, Jacksonville, Fla., has purchased from the County Commissioners of Hillsboro County, that State, eight miles of 25-pound steel rails, with fastenings and

spikes; 10 Austin four-yard dump cars, one 14-ton saddle tank Porter locomotive, a 36-inch gauge portable road crusher, with elevator engines, boilers, scrapers, &c., all in good condition.

The Gunnell Tool Company, Manitowoc, Wis., has reorganized as the Gunnell Machine Company, and the capital stock has been increased from \$5000 to \$35,000. The company has started work upon the erection of a new plant on South Sixteenth street, adjacent to the tracks of the Chicago & Northwestern Railroad. The main building will be a machine shop, 60 x 106 feet, two stories. Later several additions will be constructed. Elias Gunnell is president; Charles West, secretary, and L. E. Geer, treasurer.

The Robins Conveying Belt Company, Park Row Building, New York, has recently obtained contracts for large coal pockets and conveying machinery for the Erie Railroad Company at Buffalo, N. Y., and at Port Jervis, N. Y. It is also completing orders for belt conveyors intended for paper mills in Sweden and has an order under way from the Power & Mining Machinery Company for a belt conveyor for handling ore.

John R. Proctor, Gadsden, Ala., has purchased the plant formerly known as the Gadsden Car & Machine Works, which will be operated under the name of the Proctor Foundry & Machine Works. General machine, foundry, blacksmith and pattern work will be done. The foundry has been leased to H. F. De Lorme and T. M. Fullington, who will operate that department.

The directors of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, have called a meeting of the stockholders at Cleveland on October 11, 1905, to consider changes in the charter of the company covering the following points: 1. That the holders of the preferred stock of the company shall have a right to vote said stock the same as the common stock is voted. 2. To provide that the preferred stock may be retired at any dividend period by the payment of par, a premium of 5 per cent. thereon and all accrued and unpaid dividends. 3. To provide that the dividends payable to the common stockholders of said company shall be limited to not exceed 10 per cent. per annum until all of the preferred stock of said company is retired.

The Delaware, Lackawanna & Western Railroad Company intends to erect a new engine house at Syracuse, N. Y.

William R. Thropp, Trenton, N. J., is building a brick and steel addition to his plant, 65 x 84 feet, two stories, to be used as an erecting shop and for the manufacture of rubber working machinery. The new building will be equipped with a traveling crane.

The plant of the Vulcan Foundry & Machine Company, at New Castle, Pa., builder of rolling mill machinery, and which has been idle for some time, is expected to start up during October.

The Danville & Western Railroad Company proposes to rebuild as promptly as possible the machine and repair shops recently destroyed by fire at Danville, Va.

The Kansas City Southern Railway Company is contemplating enlarging its Pittsburgh shops, but no plans have been prepared as yet. The company recently purchased 20 locomotives from the American Locomotive Company, and it has also bought 1400 freight cars. The avowed policy of the management of the road is toward a general upbuilding of the system.

Power Plant Equipment.

In order to provide more room in its manufacturing plant, the Minneapolis Steel & Machinery Company, Minneapolis, Minn., is now putting up a one-story addition, 48 x 60 feet, which is to be used as a testing room for the gas engines which the company makes. The new structure will be of brick and steel, fire proof, and will cost about \$10,000. C. F. Haglin has the contract for its erection. When the addition is completed it will mean an increase in the working force of 75 men, making a total force in office and shops of the company of 987 men.

The Valparaiso Lighting Company has been incorporated as Valparaiso, Ind., with \$150,000 capital stock. The directors are Clarence H. Geish, Chas. H. Kelsey and Edward Clifford.

Improvements costing \$50,000 will be made to the water works of the New Albany Water Company, New Albany, Ind. The money will be expended on the pumping station.

Foundries.

The Pennington Boiler & Foundry Company, Pennington, N. J., which was recently incorporated with a capital stock of \$100,000, will take over the plant of the Pennington Foundry & Heater Company and will manufacture a full line of steam and hot water boilers and hot air furnaces and in addition will conduct a general foundry business. The company expects to have the plant in full operation by October 20. J. W. Sheeler is president; Frank F. Glenn, vice-president and secretary, and Thomas T. Burchfield, treasurer and general manager.

The Eagle Smelting & Refining Works, New York, has about completed its plant at Somerville, N. J., called the Somerville Iron Works, for the manufacture of soil pipe and fittings. The company will have a daily capacity of 50 tons.

The Liberty Brass Foundry Company, Buffalo, N. Y., has purchased a new site on Niagara street and will erect a large brass foundry and a factory building four stories in height, 77 x 124 feet.

The American Bell & Foundry Company, Northville, Mich., has purchased the Argo grist mill property, a landmark in that section of the country, having been built in 1837. The company will dismantle the mill entirely, using the building for storage purposes and converting the water power to the operation of its iron business.

The Malleable Iron Works, New Britain, Conn., has recently completed a brick addition to its foundry, 55 x 80 feet, and has installed a modern air furnace with an additional capacity of 20 tons, making the total capacity of the foundry 30 tons per day. A complete system of Hunt's industrial railway and an especially constructed crane for handling metal have also been put in. This company is old established and well known, producing malleable iron castings of every description, and is also prepared to make gray iron castings up to 4000 pounds.

General Manager H. A. McCord of the Western Steel Car & Foundry Company has received authority to rebuild the malleable iron foundry at Anniston, Ala., and the work has begun. The company will expend \$50,000 in rebuilding and equipping the foundry, which was burned several years ago and crippled to a considerable extent the working of the plant.

E. M. Dart Mfg. Company, Providence, R. I., manufacturer of union couplings, advises us that its enlargement is well under way and when completed will increase its capacity 50 per cent. This addition is partly due, it states, to its export trade, which more than doubled last year. A recent London order received called for 7000 Dart patent unions.

Bridges and Buildings.

The Huron Bridge & Iron Company, Port Huron, Mich., has received the contract for the construction of a 210-foot bridge on Gratiot avenue over the Clinton River at Mt. Clemens for \$7450.

The Indianapolis Bridge Company, Indianapolis, Ind., secured the contract from the Johnson County Commissioners for a bridge at Franklin to cost \$8000.

Fires.

The plant of the Climax Fuse Company, Avon, Conn., was destroyed by fire September 15. The loss is placed at \$100,000.

The Featherstone Foundry & Machine Company's Building at Chicago, Ill., was destroyed by fire September 14. The loss is placed at \$150,000.

The Foundry and machine shops of the Hansell-Elcock Company, Chicago, were recently destroyed by fire. The loss is placed at about \$75,000.

The buildings of the Hayes Iron Foundry, West Lynn, Mass., were recently burned. The loss is placed at about \$5000.

The plant of the Roberts Chemical Company, Niagara Falls, N. Y., was destroyed by fire on the 15th inst. Loss, \$5000. The officers of the company state the plant will be rebuilt at once.

Hardware.

The Western Steel Gate Company, Two Rivers, Wis., has re-incorporated as the Western Steel & Iron Company, with offices at Green Bay, Wis. The company will make a specialty of a line of steel gates and post hole diggers. The following are the officers: President, Chas. W. Van de Walker; treasurer, Garth W. Cate; secretary, Dr. A. M. Farrell; vice-president and general manager, Robert T. Jenney.

The Thomas Mfg. Company, Springfield, Ohio, has purchased the mower department of the Janesville Machine Company, Janesville, Wis., including patents, machinery, &c., and will hereafter manufacture the Crown mower, which has been built by the Wisconsin firm for 40 years. The Thomas Company makes rakes, tedders, hay loaders, disk and spring tooth harrows, grain drills, &c.

The Loudon Machinery Company, manufacturer of Loudon hay tools, barn door hangers and hardware specialties, Fairfield, Iowa, is erecting a three-story 90 x 156 foot building, to be used exclusively for storage purposes. Electric elevators will be installed. To fill orders with promptness the company has found it necessary to carry a larger and heavier stock.

The Walker & Ehrman Mfg. Company, manufacturer of set, cap and machine screws, Chicago, has completed its removal to its new plant at Homan and Fillmore streets.

The B-B Mfg. Company, Davenport, Iowa, is building a two-story brick addition, to be used for warehouse purposes. The firm reports a large demand for its improved Dewey hog waterer and a rapidly increasing business in its washing machine.

The Hays-Henderson Saw & Supply Company, Chattanooga, Tenn., which was recently organized with a capital stock of \$25,000, has about completed a factory for the manufacture of circular saws, planer knives, bits and other similar lines. The company expects to be turning out goods by October 1.

Streator Metal Stamping Company, Streator, Ill., reports that the demand for its steel carpet sweepers has necessitated the making of a large addition to its plant. The company now has a capacity of 400 sweepers per day, which it is expected will be fully taxed the coming season, as many well known houses throughout the country are taking up this line.

Nine years ago the J. Stevens Arms & Tool Company, Chicopee Falls, Mass., under the former management, was employing but 44 men. To-day there are on the pay roll over 1400 persons. During this period the plant has been successively enlarged, but notwithstanding the magnitude of the additions the company is still cramped for room and is now adding two stories to what is known as Mill No. 2 of the power plant, which was formerly a four-story building, making it six stories high. A seven-story tower is also being built for the stairways, elevator, lavatories, &c., which will add even more to the available space than the two floors, 45 x 215 feet, which are being built. The increased space will be available by the end of September.

The Hobbs Mfg. Company, Worcester, Mass., has purchased the plant and business of the American Wire Washer Company, Unionville, Conn., and has removed the business to Worcester, where it will have a place in the shops of the Hobbs Company. Washers of all kinds are manufactured in automatic machines from wire, there being practically no waste, 100 pounds of wire producing 100 pounds of washers. Several machines have already been built and are producing washers, while others will be built at the shops of the Hobbs Mfg. Company. This company manufactures box making machinery and is developing a line of wood working machinery from that of the Witherby, Rugg & Richardson Company, which it bought out about two years ago and whose shop, considerably enlarged, it now occupies. The Hobbs Company and the Spencer Wire Company, also of Worcester, are closely allied in ownership, which is one of the reasons for taking on the line of wire washers, another reason being the presence of available space in the Hobbs shops.

The Miller Lock Company, Frankford, Philadelphia, Pa., is building a two-story addition, 47 x 50 feet, to its brass foundry.

Miscellaneous.

The Pennie patent back water and sewer gas valve, heretofore manufactured by Haydenville Company, Haydenville, Mass., under rights granted by the patentee, will be hereafter manufactured and sold exclusively by the Kennedy Valve Mfg. Company, New York. Charles Hess, formerly with the Haydenville Company, is sole owner and patentee of the valves.

An addition 50 feet square and one story is being built to the shops of the Crompton & Thayer Loom Works, Worcester, Mass.

The Carnegie Steel Company, Pittsburgh, has received an order from the St. Louis Traction Company for 1500 steel ties of the type illustrated in *The Iron Age* some time ago.

The new Leicester Card Clothing Company, Leicester, Mass., has purchased the machinery and business of the Walpole Card Clothing Company, Walpole, Mass., and will equip its Leicester factory from the purchase.

The Lackawanna Iron & Steel Company has started two of the five batteries of coke ovens at its Colebrook furnace plant. The company is operating all of its furnaces in the Lebanon, Pa., district, and big shipments are being made to Buffalo.

The alternating current motor is coming into greater use for elevator purposes, both freight and passenger, the increase in this demand keeping pace with the rapid growth of popularity of the alternating current for general purposes. The Salem Elevator Works, Salem, Mass., reports that it is very busy, the orders being chiefly for elevators equipped with direct connected and single belt connected reversing motors, which are used with an automatic controller actuated by the shipper rope of the elevator. This equipment is furnished both with direct and alternating current.

The Merrill-Stevens Company, Jacksonville, Fla., expects to launch its floating dock early in October. This will be the only dock of the kind on the Atlantic coast south of Cape Hatteras. Dimensions on the keel block are: 332 feet long, 65 feet wide between sides, accommodating 20-foot draft vessels, and it will lift 4200 tons displacement. The company is now building 11 steel barges for the Panama Commission and a steel molasses barge for use in Cuba.

Cyril Thornton and F. Sherman, Youngstown, Ohio, have formed the Youngstown Iron & Metal Company and will do a general business in buying and selling iron, brass, copper and other metals.

The Evansville Pump & Mfg. Company has been incorporated at Evansville, Ind., with \$15,000 capital stock by John Pfender, Chas. E. Pfender and Philip P. Euler. The company's chief line is metal pumps.

The Metal Mfg. Company has been incorporated at Evansville, Ind., with \$25,000 capital stock, by Jos. F. Bartholomew, Wm. G. Frank and Jacob Caddon. The company will erect a plant, the first in the State, for the manufacture of metal household furniture.

The Voelke Seamless Float Company has been incorporated at Tipton, Ind., with \$10,000 capital stock. The directors are Fred. A. Voelke, Martha Voelke and Noah R. Walker. The company will manufacture metallic articles.

The Ewart Mfg. Company, which has been making chains at Indianapolis, Ind., for many years, has been incorporated with \$500,000. The directors are Alfred A. Pope, J. H. Whittemore, T. B. Marston, Avery Coonley and G. G. Howe. Mr. Howe is resident manager.

The James L. Taylor Dredge Mfg. Company has been incor-

porated at Royal Center, Ind., with \$100,000 capital stock by James L. Taylor, William Gundrum and Wm. J. Goodrich.

The Boonville Implement Company has been incorporated at Boonville, Ind., with \$10,000 capital stock. The directors are Henry J. Ehrhardt, C. F. W. Inderreiden and John A. Knight.

The Continental Iron & Steel Company, New York, has awarded the contract to the H. Wales Lines Company, Meriden, Conn., for the construction of its new plant at Rahway, N. J. The plant will consist of a main building, 75 x 160 feet, two stories high; another building, 75 x 120 feet, one story high; power house, 40 x 54 feet; a building 20 x 22 feet and an office building, 35 x 70 feet. This plant is to be used for the manufacture of a material the character of which the company is not ready to announce.

The Franklin Brass Works, Franklin, Ind., has been incorporated with \$30,000 capital stock. The directors are Wm. H. Couter, John P. Given, George T. Dinwiddle, Jesse B. Marvin and Harry C. Sheridan.

Edgar A. Turrell has been appointed receiver for the American Corundum Company of New York and Bridgeport, Conn.

D. H. Roberts, formerly vice-president and general manager of the McRae & Roberts Company, Detroit, Mich., manufacturer of steam brass goods, has retired from that company and expects to organize a new company, composed principally of himself and his sons, to manufacture a line of brass goods.

Trade Publications.

Steam Specialties.—Loew Supply & Mfg. Company, Cleveland, Ohio. Catalogue, 8½ x 12 inches, 30 pages. Illustrated with half-tones, sections and diagrams. Describes a vertical and a horizontal grease and oil separator, a combination separator and open feed water heater, an open feed water heater, a combination separator and closed cast iron feed water heater, a combination separator and tubular feed water heater, a tubular feed water heater, a horizontal and a vertical steam separator, an exhaust head and a steam surface condenser. Appended is a description of the Loew adjustable die stock.

Water Softening and Purifying.—Wm. B. Scalf & Sons Company, 221 First avenue, Pittsburgh, Pa. Pamphlet. Contains views of a number of typical installations of Scalf and We-fu-go water softening and purifying systems, with the capacities of the plants and their locations.

Shaking and Dumping Grates.—A. D. Granger Company, 95 Liberty street, New York City. Bulletin No. 4. Size, 6 x 9 inches; pages, 24. Deals with Vulcan shaking and dumping grates, stationary grates of all patterns, cast iron boiler fronts, steel plate boiler fronts and other boiler castings.

Grinding and Polishing Machinery.—Builders Iron Foundry, Providence, R. I. Illustrates grinder heads for wheels from 8 to 18 inches in diameter, a surface grinder and grinder head combined, 12-inch polishing wheel stand, 14-inch ring oiling polishing machine and 8, 10 and 12 inch patent countershafts.

Steam Engines.—A. L. Ide & Son, 11 Broadway, New York. Pamphlet. An exposition of the advantages of the Ideal engine.

Electric Generators.—Crocker-Wheeler Company, Amper, N. J. Bulletin 53, superseding 43. Concerned with direct current lighting and power generators, the parts being illustrated in detail and a number of installations shown.

Pumps.—Crestline Mfg. Company, Crestline, Ohio. Catalogue B, 7 x 10 inches, 75 pages. Illustrates an extensive line of pumps for hand, wind mill and belt power in iron and brass patterns and other plumbing specialties and castings, including cylinders, cast sinks, brackets, boiler stands, tank heaters, &c. With each illustration is given a brief description and specifications of the sizes in which the article is made.

Electric Grinders and Buffers.—Northern Electrical Mfg. Company, Madison, Wis. Bulletin 48. Devoted to a discussion of the possibilities for shop and factory economy by the use of Northern electric grinders and buffers. These are described as simple, self contained, dust proof and economical. They are of special design and construction and are provided with heavy crucible tool steel armature shafts, liberal bearings and dust proof covers. The standard emery grinders and buffing lathes are equipped with speed regulating devices so that the speed of the grinding and buffing wheels can be varied to compensate for the varying diameters of the wheels.

Gas Blast Furnaces and Flexible Shafts.—Chicago Flexible Shaft Company, Chicago. Catalogue, 6 x 9 inches. Describes the Stewart gas furnace in its various forms and sizes, entering into the details of the mechanism and explaining the many uses to which it may be put. Illustrations show the combination furnace for muffle, forge and crucible work, details of each section being given; special combination furnace, No. 1 muffle furnace, No. 1 oven furnace, No. 2 muffle or oven furnace, No. 3 muffle and oven furnace, single and double crucible furnaces, furnaces for high speed steel and magnet steel, No. 2 rivet heating furnace, No. 1 forge, automatic furnaces, brass melting furnaces, rotary positive pressure blower and a long line of flexible shafts, drills, grinders, spindles, clutches, countershafts, pulleys, &c.

Induction Motors.—Richmond Electric Company, Richmond, Va.—Bulletin 6. Gives an illustrated description of the R. E. type induction motors. These are new to the market since the expiration of the patents, which have heretofore prevented competition in this country. To a large extent this motor follows the practice in Europe, where there has been considerable competition and more work done in the perfecting of the product.

Metallic Cement.—Smooth-On Mfg. Company, Jersey City, N. J. The Smooth-On elastic cement instruction book. This cement, which is the latest preparation of this company, is an iron elastic cement made in paste form ready for use. Its advantages are that it is metallic and can be applied to hot iron. As the heat causes it to metallize instantly it is claimed to be invaluable for stopping leaks. The book is useful in indicating various methods for using the cement in miscellaneous repair work.

Rotary Planing Machines.—Newton Machine Tool Works, Twenty-fourth and Vine streets, Philadelphia, Pa. Catalogue 41. Illustrates a number of rotary planing machines, which are now made of one general design in varying sizes, having cutter heads from 26 to 100 inches in diameter. These are made in plain or portable forms or mounted on circular sub-bases or long beds for facing off both ends of work simultaneously. The plain machines are made for either belt or motor drive, and the portable and sub-base forms for motor drive only. A number of machines adapted for special work are also shown.

Steam Engines.—A. L. Ide & Sons, 11 Broadway, New York City. Pamphlet. Contains an interesting and comprehensive description of the Ideal steam engines, with an excellent selection of engravings to illustrate the construction of the important details and the general principle of operation.

Centrifugal Pumping Machinery.—Morris Machine Works, Baldwinsville, N. Y. Catalogue No. 11. Illustrates and describes only the regular line of pumps for different purposes, but the company is prepared to build centrifugal pumps of any size and for any duty for which this type of pump can be adapted. The lists and descriptions are made as complete as possible in the limited space, and useful data for calculating has been added.

Air Lift Pumping.—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York. Pamphlet 73-A. Deals briefly with the subject of pumping water by the air lift principle and gives some valuable information. Refers to a more comprehensive catalogue which will be issued.

Pump Valves.—Crosby Steam Gage & Valve Company, 16 Dey street, New York. Circular. Lists the advantages of the Branden rubber pump valve, which is one made with an inserted wire coil, giving it an enhanced flexibility.

Wire Machinery.—Aiton Machine Company, 126 Liberty street, New York. Bulletin No. 20. Shows three types of vertical stranding machines for manufacturing small wire ropes and light cords.

Screens.—Jeffrey Mfg. Company, Columbus, Ohio. Supplement to catalogue 69. Shows revolving screens of various dimensions, cross sections and sizes of mesh for coal and crushed stone screening. The book is practically entirely made up of engravings, the purpose being to give a general idea of the numerous forms of screens made for all kinds of service. An inclosed folder illustrates different types of Jeffrey machinery for mining, elevating, conveying, cutting, hauling and screening coal.

Power Transmitting Machinery and Supplies.—Bond Foundry & Machine Company, 518 Arch street, Philadelphia, Pa. Catalogue 5. Size, 5 x 6½ inches; pages, 92. Covers an extensive line of apparatus under the foregoing classification such as hangers, boxes, pillow blocks, floor stands, couplings, collars, clutches, shafting, pulleys (wood and iron), screw conveyors, elevator buckets, link belting, sprocket wheels and leather belting.

Gas Engines.—De La Vergne Machine Company, East 138th street, New York City. Circulars and plates. One of the plates gives an illustration of a single acting Koerting gas engine, and another a view of a double acting two-cycle Koerting gas engine, made in sizes of from 250 to 2000 horse-power. The circulars refer respectively to Koerting gas engines and Hornsby Akroyd oil engines. The first is called a central station power bulletin and is concerned with the adaptability of these engines for power plants. In this connection some mention is made of the Koerting pressure gas producer. The other circular shows several sizes of oil engines and describes the classes of service for which they are suitable.

The Beaver Metallurgical Company has just completed the installation of a large metallurgical and chemical plant at Beaver Falls, Pa., amply provided with the necessary furnaces and machinery for the manufacture of a long line of chemical and metallurgical products on a large scale, especially those of the rare metals. For the present the company will devote itself only to the production of metallic tungsten, ferrotungsten and all other tungsten alloys and compounds.

The Iron and Metal Trades

One of the characteristic buying rushes seems to be on in the Pig Iron market, reports from all the leading distributing centers showing a heavy movement.

In Pittsburgh the purchase on the part of the Steel Corporation of a lot of 10,000 tons of Bessemer Pig for prompt delivery has been followed by some large sales, aggregating 65,000 to 75,000 tons of Bessemer and Basic Pig, the bulk being taken by a large western Pennsylvania Steel plant. Eastern Pennsylvania Steel mills have again entered the market and have taken considerable quantities of Basic Pig, the price advancing squarely to \$16, delivered.

Chicago reports large transactions in Foundry Iron, aggregating 25,000 tons, which includes one lot of 10,000 tons of Charcoal Iron to large Car Wheel makers. Cincinnati notes some round sales. In Buffalo one furnace interest placed 13,000 tons, while Pittsburgh notes the purchase by one company of 10,000 tons of Foundry Iron. It is estimated that the sales of Foundry Iron in the New York district, although individually none of them runs above 2000 tons, will foot up to 30,000 tons during the week. The greater part of this Iron is for delivery during the last quarter of this year and the first quarter of 1906.

Prices have stiffened in all directions as the result of this movement.

It is understood that the Steel Corporation will need 40,000 tons of outside Iron for October. As yet no purchases have been made, and it is not yet sure whether the Iron will be taken in one block or will be bought piecemeal.

While the largest orders for Steel Rails which were in the market last week, including the 160,000-ton order for the New York Central, have not yet been placed, some goodly contracts have been booked by the mills. They total up to over 100,000 tons, there being included in them 19,000 tons for the Tidewater Railway, 17,000 for the Reading, 10,000 tons each for the Norfolk & Western, the West Shore and the Oregon & Western, and 7500 tons for the Appalachicola & Northern. New England roads have come into the market recently and inquiries are at hand from a number of Southern systems.

Railroad buying is greatly in evidence, too, in Bridge Material. The leading interest reports that there are in hand inquiries for 100,000 tons of fabricated material, the greater part of which is for railroad bridges, some of which are large undertakings.

The scarcity of Steel is becoming more pronounced.

Additional work seems to have come to the lake shipyards, report having it that the Steel Corporation has ordered three additional large boats.

Pittsburgh reports that further important business for the Steel Car builders is pending. One system is expected to give out orders for 32,000 cars in 1906.

In the lighter lines satisfactory reports come from the Wire trade. The Merchant Steel trade is in excellent shape, and the Bar mills generally are very busy. In the Sheet trade complaint continues to be made in regard to prices, which fail to reflect the rise in Steel, so that the situation bears heavily upon those mills which do not control their own raw material.

In spite of the large tonnage placed recently in Merchant Tubes, which includes one very large order, prices remain irregular and unsatisfactory.

The Cast Iron Pipe trade has been on the *qui vive* about the contract for the New York high pressure service. It has not yet been let.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

Sept. 20, Sept. 13, Aug. 23, Sept. 21,
1905. 1905. 1905. 1904.

PIG IRON:

Foundry Pig No. 2, Standard, Philadelphia	\$16.50	\$16.25	\$16.25	\$14.25
Foundry Pig No. 2, Southern, Cincinnati	14.25	14.25	14.50	12.00
Foundry Pig No. 2, Local, Chicago	16.00	16.25	16.25	13.50
Bessemer Pig, Pittsburgh	15.85	15.85	15.35	12.60
Gray Forge, Pittsburgh	14.60	14.60	14.00	11.75
Lake Superior Charcoal, Chicago	17.00	17.00	16.50	14.75

BILLETS, RAILS, &c.:

Bessemer Steel Billets, Pittsburgh	25.00	25.00	24.00	19.50
Steel Forging Billets, Pittsburgh	29.00	29.00	26.00	....
Open Hearth Steel Billets, Philadelphia	27.00	27.00	27.00	21.50
Steel Billets, Chicago .....	....	....	29.00	22.50
Wire Rods, Pittsburgh	31.00	31.00	32.00	26.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL:

O. Steel Rails, Chicago	14.50	14.50	14.50	11.00
O. Steel Rails, Philadelphia	16.25	16.25	16.00	11.75
O. Iron Rails, Chicago	22.00	20.50	20.00	16.00
O. Iron Rails, Philadelphia	22.00	22.00	20.50	15.50
O. Car Wheels, Chicago	16.00	15.50	15.00	11.50
O. Car Wheels, Philadelphia	15.50	15.50	15.50	11.50
Heavy Steel Scrap, Pittsburgh	16.00	16.00	15.00	11.50
Heavy Steel Scrap, Chicago	14.50	14.50	13.00	10.00

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia	1.68½	1.63½	1.63½	1.43½
Common Iron Bars, Chicago	1.65	1.65	1.60	1.35
Common Iron Bars, Pittsburgh	1.75	1.70	1.60	1.25
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.44½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.30
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.54½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.40
Beams, Tidewater	1.89½	1.89½	1.74½	1.54½
Beams, Pittsburgh	1.70	1.70	1.60	1.40
Angles, Tidewater	1.89½	1.89½	1.74½	1.54½
Angles, Pittsburgh	1.70	1.70	1.60	1.40
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, Sheared Steel, Pittsburgh	1.55	1.55	1.55	1.35
Sheets, No. 27, Pittsburgh	2.20	2.20	2.20	2.00
Barb Wire, f.o.b. Pittsburgh	2.20	2.20	2.15	2.05
Wire Nails, f.o.b. Pittsburgh	1.75	1.75	1.70	1.60
Cut Nails, Mill	1.60	1.60	1.60	1.60

METALS:

Copper, New York	16.00	16.00	16.00	12.75
Spelter, St. Louis	5.85	5.85	5.65	4.95
Lead, New York	4.85	4.85	4.60	4.20
Lead, St. Louis	4.72½	4.75	4.50	4.10
Tin, New York	32.00	32.05	33.15	27.62½
Antimony, Hallett, New York	14.00	14.00	15.00	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.49

Chicago.

FISHER BUILDING, September 20, 1905.—(By Telegraph.)

Heavy buying of Plates, Shapes and Track Material has been the feature of the week's Iron trade. Shipbuilding interests placed contracts for Plate and Shape requirements for ten lake steamers aggregating 20,000 tons of Plates and 30,000 tons of Shapes, the former to be rolled by a local mill, while the Structural Shapes have been assigned to Pittsburgh. Additional tonnage for shipbuilding purposes, aggregating 30,000 tons, is under negotiation. Railroad purchases of Track Material have been in proportion to the Rail orders already placed, one Western road having purchased 4000 tons of Spikes and 2000 tons of Bolts. Under the stimulus of this heavy buying prices have advanced. The Rail mill of the Illinois Steel Company now has orders booked for 550,000 tons for 1906 delivery, and the orders that will be carried into next year aggregate 50,000 tons. The Republic Iron & Steel Company has booked only a small tonnage of Rails for next year's delivery, and its Youngstown mill will turn to Sheet Bars from Rails at an early date. Relaying Rails have advanced sharply under the demand of traction companies and small railroads that are unable to secure early deliveries from Rail mills. Premiums on Structural Shapes from stock are only limited to prices that consumers are willing to pay, and on new business mills are not promising delivery before next year. The Illinois Steel Company is not yet booking tonnage against the output of its new Structural Shape mill, as from present indications it will not be placed in operation before the first of the year. Pressure on mills for Plates and Bars is heavy. The buying of Merchant Steel on the part of agricultural interests continues heavy and one large Eastern maker has withdrawn from the market, its capacity having been taken to next July. The Pig Iron market has been unusually ac-

tive, consumers covering requirements through the first quarter of next year, and sales of all grades aggregate 25,000 tons for the week. Southern Iron is now firmly established on the basis of \$12, Birmingham, and a few producers are considering a 50c. advance.

Pig Iron.—Several large interests closed contracts during the week for deliveries extending through the first quarter of next year. The J. I. Case Threshing Machine Company purchased 5000 tons of Northern and Southern Foundry, and one large car wheel interest contracted for 10,000 tons of Lake Superior Charcoal. Sales of smaller lots, ranging from 500 to 2000 tons, have been numerous, and the inquiry continues heavy. Local furnaces have their output practically booked through the first quarter of next year and are not in position to take on heavy requirements. Southern furnaces are now asking \$12, Birmingham, for deliveries extending through the first three months of next year, and several are urging an advance of 50c. a ton. The following prices represent the figures quoted on current Iron, but most of the furnaces are willing to take orders through the first quarter of next year at the maximum prices named:

Lake Superior Charcoal.....	\$17.00 to	\$17.50
Northern Coke Foundry, No. 1.....	16.75 to	17.00
Northern Coke Foundry, No. 2.....	16.00 to	16.50
Northern Coke Foundry, No. 3.....	15.75 to	16.25
Northern Scotch, No. 1.....	17.25 to	17.50
Ohio Strong Softeners, No. 1.....	17.30 to	17.55
Ohio Strong Softeners, No. 2.....	16.80 to	17.05
Southern Silvery, 4 to 6 per cent. Silicon.....	16.65 to	17.65
Southern Coke, No. 1.....	16.15	
Southern Coke, No. 2.....	15.65	
Southern Coke, No. 3.....	15.15	
Southern Coke, No. 4.....	14.90	
Southern Coke, No. 1 Soft.....	16.15	
Southern Coke, No. 2 Soft.....	15.65	
Southern Gray Forge.....	14.65	
Southern Mottled and White.....	14.40	
Malleable Bessemer.....	17.00 to	17.25
Standard Bessemer.....	17.50	
Jackson Co. and Ky. Silvery, 6 % Silicon.....	18.30	
Jackson Co. and Ky. Silvery, 8 % Silicon.....	19.30	
Jackson Co. and Ky. Silvery, 10 % Silicon.....	20.30	
Alabama Basic.....	16.90	

Metals.—There has been no change in Copper, but Pig Tin in small lots is off $\frac{1}{2}$ c. We quote Casting Copper in car lots 16 $\frac{1}{4}$ c. to 16 $\frac{3}{4}$ c.; Lake, 16 $\frac{1}{2}$ c.; less than car lots $\frac{1}{2}$ c. to $\frac{3}{4}$ c. higher; Pig Tin, car lots, 34 $\frac{1}{2}$ c. to 35c.; smaller lots, 35 $\frac{1}{2}$ c. Spelter is held at 6c. for car lots and 6 $\frac{1}{2}$ c. to 6 $\frac{3}{4}$ c. for small lots. Lead is 4.90c. for 50-ton lots, 4.95c. for car lots and 5 $\frac{1}{4}$ c. to 5 $\frac{1}{2}$ c. for small lots. Sheet Zinc is \$7.50 list, f.o.b. LaSalle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 14c.; Heavy Copper, 13 $\frac{3}{4}$ c.; Copper Bottoms, 12 $\frac{3}{4}$ c.; Copper Clips, 13 $\frac{1}{2}$ c.; Red Brass, 12 $\frac{3}{4}$ c.; Red Brass Borings, 10 $\frac{3}{4}$ c.; Yellow Brass, Heavy, 9 $\frac{1}{2}$ c.; Yellow Brass Borings, 7 $\frac{3}{4}$ c.; Light Brass, 7 $\frac{1}{4}$ c.; Lead Pipe, 4c.; Tea Lead, 3 $\frac{3}{4}$ c.; Zinc, 4 $\frac{1}{4}$ c.; Pewter, No. 1, 21c.; Block Tin Pipe, 27 $\frac{1}{2}$ c.

(By Mail.)

Billets.—The demand for Forging Billets is heavy and quotations range from \$31 to \$32 in car lots for base sizes, with the usual extras, while premiums are asked for prompt shipment. There is little demand for Rolling Billets.

Rails and Track Supplies.—The Rail mill of the Illinois Steel Company now has orders on its books for approximately 550,000 tons for 1906 delivery. About 500,000 tons was booked during a period of two weeks, which will no doubt stand as the record booking for Rail mills. This mill will carry upward of 50,000 tons into next year which was booked for this year's delivery. The orders now on the company's books insure full operation for the next 14 months. Purchases of Track Material by the railroads are in the same proportion as the Rail tonnage placed, one road this week having placed an order for 4000 tons of Spikes and 2000 tons of Track Bolts. Angle Bars accompanying Rail orders for 1906 delivery are quoted at 1.50c., as compared with 1.25c. early this year and which was subsequently advanced to 1.35c. Small lots of Angle Bars are quoted at 1.75c. Due to the recent heavy buying, Spikes have been advanced \$1 a ton. Demand for Light Rails is improving, but prices still continue to rule considerably below those of Standard Sections. Sections ranging from 30 to 45 lbs. are quoted at \$25; 25-lb., \$26; 20-lb., \$27; 16-lb., \$28; 12-lb., \$29; lighter Sections down to 8-lb., \$35 to \$38, f.o.b. mill. Angle Bars accompanying large Rail orders, 1.50c.; car lots, 1.65c. to 1.70c. Spikes are in big demand at 1.80c. to 1.90c. Track Bolts are unchanged at 2.40c. to 2.50c., base, Square Nuts. Store prices on Track Supplies range from 15c. to 20c. above car lot mill prices.

Structural Material.—Contracts for approximately 30,000 tons of Structural Material were placed with local mills during the past week. The new Structural mill of the Illinois Steel Company will hardly be available before the first of the year and no tonnage has yet been booked against its output. Material for prompt delivery is at a premium, one contract for 200 tons of different sizes for St. Louis delivery having been placed at 2.50c. Quotations on Structural Steel for future delivery from mill, in car lots or greater, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86 $\frac{1}{2}$ c.; Angles, 3 to 6 inches, $\frac{1}{4}$ -inch and heavier, 1.86 $\frac{1}{2}$ c.; Angles larger than 6 inches on one or

both legs, 1.96 $\frac{1}{2}$ c.; Beams, larger than 15 inches, 1.96 $\frac{1}{2}$ c.; Zees, 3 inches and over, 1.86 $\frac{1}{2}$ c.; Tees, 3 inches and over, 1.91 $\frac{1}{2}$ c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.50c. to 3c., according to quantity on hand in store or obtainable from mill.

Plates.—During the past week orders for the Steel for ten lake steamers have been placed, aggregating 20,000 tons of Plates and close to 30,000 tons of Structural and other material. Orders for 30,000 tons of Steel for the construction of additional lake boats are pending. Stocks accumulated at most of the boiler shops during the months of May and June, just prior to the expiration of a number of low priced contracts, are nearly depleted, and boiler makers are now in the market to cover future requirements. While Western mills continue behind on deliveries from two to three months, Eastern mills are promising shipment in from one to two weeks. The differential of 10c. on Tank quality from 6 $\frac{1}{4}$ to 14 inches has been withdrawn by all the mills. Prices are unchanged, as follows: Tank quality, $\frac{1}{4}$ -inch and heavier, wider than 6 $\frac{1}{4}$ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76 $\frac{1}{2}$ c.; 3-16 inch 1.86 $\frac{1}{2}$ c.; Nos. 7 and 8 gauge, 1.91 $\frac{1}{2}$ c.; No. 9, 2.01 $\frac{1}{2}$ c.; Flange quality in widths up to 100 inches, 1.86 $\frac{1}{2}$ c., base, for $\frac{1}{4}$ -inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86 $\frac{1}{2}$ c.; Flange quality, 1.96 $\frac{1}{2}$ c. Store prices on Plates are as follows: Tank plate, $\frac{1}{4}$ -inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.10c. to 2.15c.; Flange quality, 25c. extra.

Sheets.—The Sheet market continues in a demoralized condition and large buyers are taking advantage of the low prices quoted to cover their requirements for the remainder of the year. Independent Sheet mills, owing to the high prices they are compelled to pay for Sheet Bars, are not in a position to meet some of the low prices that are now being quoted. Prices are irregular, but the following quotations represent about current figures: Blue Annealed, Nos. 9 and 10, 1.81 $\frac{1}{2}$ c. to 1.86 $\frac{1}{2}$ c.; Box Annealed, Nos. 18 and 20, 2.16 $\frac{1}{2}$ c. to 2.21 $\frac{1}{2}$ c.; No. 27, 2.31 $\frac{1}{2}$ c. to 2.36 $\frac{1}{2}$ c.; No. 28, 2.41 $\frac{1}{2}$ c. to 2.46 $\frac{1}{2}$ c., with the customary differentials between gauges. Store prices are 2c. to 2.10c. for No. 10 Blue, 2.05c. to 2.15c. for No. 12 Box, 2.10c. to 2.20c. for No. 14, 2.20c. to 2.30c. for No. 16, 2.40c. to 2.50c. for Nos 18 and 20, 2.50c. for Nos. 22 and 24, 2.55c. to 2.65c. for No. 26, 2.60c. to 2.70c. for No. 27, 2.70c. to 2.80c. for No. 28, 2.95c. to 3.05c. for No. 30. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at \$1 a ton less: No. 10, 2.41 $\frac{1}{2}$ c. to 2.46 $\frac{1}{2}$ c.; Nos. 17 to 21, 2.81 $\frac{1}{2}$ c. to 2.86 $\frac{1}{2}$ c.; No. 27, 3.26 $\frac{1}{2}$ c. to 3.31 $\frac{1}{2}$ c.; No. 28, 3.46 $\frac{1}{2}$ c. to 3.56 $\frac{1}{2}$ c. Store prices on Galvanized Sheets are irregular, depending upon competition, high prices being demanded for sizes difficult to obtain. Prices are as follows: Nos. 10, 12 and 14, 3.10c. to 3.20c.; Nos. 16 to 20, 2.90c. to 3c.; Nos. 22 to 24, 3c. to 3.15c.; No. 26, 3.20c. to 3.35c.; No. 27, 3.40c. to 3.55c.; No. 28, 3.60c. to 3.75c.; No. 30, 4.85c. to 4.95c.

Bars.—Iron Bars are now firmly held on the basis of 1.65c. for desirable tonnage, and in small lots 1.70c. is asked. On Steel Bars mills are falling further behind on deliveries and an early advance is anticipated by the trade. Hoops were advanced \$2 a ton on September 15, but jobbers continue to quote unchanged prices from store. We quote: Iron Bars, 1.65c. to 1.70c.; Steel Bars, 1.66 $\frac{1}{2}$ c., both half extras; Hoop, 1.91 $\frac{1}{2}$ c., extras as per Steel card; Soft Steel Angles and Shapes, 1.76 $\frac{1}{2}$ c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—One of the largest Eastern manufacturers of Agricultural and Merchant Steel Shapes has withdrawn from the market to July, next year. Not all of the mills, naturally, are booked so far ahead, but the new tonnage that is being placed continues heavy, and the following prices are firmly maintained: Smooth Finished Machinery Steel, 1.91 $\frac{1}{2}$ c.; Smooth Finished Tire, 1.86 $\frac{1}{2}$ c.; Flat Sleigh Shoe, 1.71 $\frac{1}{2}$ c.; Concave and Convex Sleigh Shoe, 1.86 $\frac{1}{2}$ c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21 $\frac{1}{2}$ c.; Railway Spring, 1.86 $\frac{1}{2}$ c.; Crucible Tool Steel, 6 $\frac{1}{2}$ c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots, in base territory.

Merchant Pipe.—Jobbers and large consumers are taking advantage of the low prices prevailing and are covering future requirements, but the tonnage placed thus far this month is not quite as heavy as that placed during the same period in August. Only in exceptional cases is better than 80 per cent., f.o.b. Pittsburgh, quoted, although somewhat lower prices were ruling a week ago. Current dis-

counts to consumers from mill on Black Steel Pipe are 77.35 to 77.85 per cent. on the base sizes, $\frac{3}{4}$ to 6 inches, and Galvanized is quoted at 10 points less discount. Iron Pipe, while suffering from the low prices made on Steel, is still quoted at from $1\frac{1}{2}$ to 2 points higher. From store, in small lots, Chicago, jobbers are quoting 76.5 to 77 per cent. discount.

Boiler Tubes.—The demand continues strong and prices are well maintained. Official discounts, f.o.b. Chicago, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to $1\frac{3}{4}$ inches.....	40	35	42 $\frac{1}{2}$
$1\frac{3}{4}$ to $2\frac{1}{4}$ inches.....	50	35	35
$2\frac{1}{4}$ inches.....	52 $\frac{1}{2}$	35	30
$2\frac{3}{4}$ to 5 inches.....	60	47 $\frac{1}{2}$	42 $\frac{1}{2}$
6 inches and larger.....	50	35	..

Cast Iron Pipe.—Current business is limited to small lots of Pipe for delivery within the next few months. On the smaller sizes, from 4 to 8 inches, deliveries cannot be made in less than two months. No large contracts are pending. Prices on current business are as follows, f.o.b. Chicago, per net ton: Water Pipe, 4-inch, \$29.50; 6, 8 and 10 inch, \$28.50; 12-inch and larger, \$27.50 per net ton, f.o.b. Chicago, with \$1 extra for Gas Pipe. Large municipal contracts are, of course, placed at lower basis than this.

Coke.—The demand for Connellsville Foundry Coke is only fair and producers continue to ask \$2.50 at the ovens for both prompt and future shipment, which is equivalent to \$5.15, Chicago. Furnace Coke is held firmly at \$2, or \$4.65, Chicago, to the users of Furnace Coke outside of blast furnaces, who pay the regular \$2.65 freight rate, while blast furnaces have a rate of \$2.35.

Old Materials.—Lists of the Rock Island system, Northern Pacific and Chicago, Milwaukee & St. Paul, aggregating 4000 tons, will be closed this week. An average of 50c. advance over prevailing quotations was secured by the Atchison, Topeka & Santa Fé Railroad, whose list was closed last week and which disposed of nearly 4000 tons. There has been a sharp advance in the price of Relaying Rails. The demand has greatly increased owing to the inability of the Rail mills to make early deliveries, and large consumers, such as traction companies, are offering from \$26.50 to \$27 for early delivery. The following quotations represent the range of prices paid by large consumers from producers and dealers in car lots and greater, f.o.b. Chicago:

Old Iron Rails.....	\$22.00 to \$22.50
Old Steel Rails, 4 feet and over.....	15.50 to 16.00
Old Steel Rails, less than 4 feet.....	14.50 to 15.00
Heavy Relaying Rails, subject to inspection.....	26.50 to 27.00
Old Car Wheels.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	14.50 to 15.00
Frogs, Switches and Guards.....	14.50 to 15.00
Mixed Steel.....	11.50 to 12.00

The following quotations are per net ton:

Iron Fish Plates.....	\$17.50 to \$18.00
Iron Car Axles.....	23.50 to 24.00
Steel Car Axles.....	17.50 to 18.00
No. 1 Railroad Wrought.....	16.50 to 17.00
No. 2 Railroad Wrought.....	15.50 to 16.00
Locomotive Tires, smooth.....	14.25 to 14.50
Railway Springs.....	13.75 to 14.25
No. 1 Dealers' Forge.....	12.50 to 13.00
Wrought Pipes and Flues.....	12.00 to 12.50
No. 1 Cut Busheling.....	12.00 to 12.50
Iron Axle Turnings.....	11.00 to 11.25
Soft Steel Axle Turnings.....	10.75 to 11.25
Machine Shop Turnings.....	10.75 to 11.00
Cast Borings.....	9.00 to 9.25
Mixed Borings, &c.....	9.00 to 9.25
No. 1 Mill.....	9.50 to 10.00
Country Sheet.....	8.25 to 8.50
No. 1 Boilers, cut to Sheets and Rings.....	11.75 to 12.25
No. 1 Cast Scrap.....	13.50 to 14.00
Stove Plate and Light Cast Scrap.....	11.00 to 11.50
Railroad Malleable.....	14.00 to 14.50
Agricultural Malleable.....	13.25 to 13.75

Philadelphia.

REAL ESTATE TRUST BUILDING, September 19, 1905.

The increase in the demand which has been indicated in these columns for several weeks past is now an accomplished fact. This naturally involves higher prices, which have also materialized. Consequently the trade are not greatly surprised, nor would they be if further advances are established in the near future. The danger will be in the demand being carried too far—that is to say, that consumers may want to buy too far ahead. A considerable tonnage has already been engaged for 1906 delivery, but with the enormous consumption which is now absolutely assured it will require millions of tons to meet requirements during the remainder of 1905 and the first half of 1906. Not a few requests are being made for deliveries covering the first half of 1906, and if all the material that is likely to be used during that period is quoted on it is safe to say that 12,000,000 to 15,000,000 tons of Pig Iron will be sold during the next 60 or 90 days. This, of course, is a prodigious tonnage, but considering the known requirements of consumers the estimate is not extravagant. It would probably be safer for buyers (and it would certainly suit producers better)

if the demand was spread over six months instead of crowded into half that time, but if buyers are determined on the latter course there will be no alternative but to let them have their own way. Buying thus far has been confined to Steel making material—Low Phosphorus, Basic, Ferromanganese and Speigeleisen. Sales of this character aggregating at least 100,000 tons have been made recently, with quite a demand yet to be supplied. There is also more doing in low grade Iron, but prices are still low, although holders are asking more money, and it would not require much demand to cause an appreciable advance, as producers expect to get better results from their furnaces now that the weather is more settled and will therefore make a larger proportion of high grade Iron. Foundry grades are about half a dollar dearer since last week, with an unusually strong demand for that class of Iron. It is unnecessary to go into details in regard to the sources of demand, as everything is being run to full capacity, with an amount of work in sight that is perfectly overwhelming. There is no danger of overestimating requirements; the difficulty will be to handle the business. Fears are expressed in regard to the freight situation. Railroad officials state that there is a strong probability of a shortage in rolling stock. They made what they considered ample provision for new equipment, but deliveries are so slow that they have very little hope of anything like an adequate supply during the winter months. This will not be entirely due to the larger Iron and fuel tonnage, but the grain crops will require greater facilities than ever before, so that the fears of a rolling stock scarcity appear to have a substantial basis. Conditions in the United States are the envy and the wonder of the whole world, and it is fortunate indeed that we have enough cereals for ourselves, with a large surplus for countries less favorably situated than we are.

Pig Iron.—Sellers have had no trouble in finding customers during the past week. The difficulty has been in discriminating as to who should have Iron, how much and at what price. Under such conditions prices have of course varied. Some have been able to buy Iron at \$16.50 for No. 2 X Foundry, others \$16.75 and some sellers quote \$17 firm. Something depends on the character of the Iron, something on when the Iron is to be delivered and something on the class of buyers. Large consumers who can be depended on to adhere closely to the terms of their contracts can of course do better than those who are liable to overtrade, and while this is more or less the case all the time it is especially so on a rising market. A fair average price at this writing would be \$16.75 for the grade of Iron named, but matters are in such shape that sellers are liable to change their quotations on very short notice. This, however, is for the future to determine. Gray Forge and low grade Foundry Irons have hardly got the move on them that they are likely to have pretty soon, \$14.50 to \$15, delivered, being about to-day's prices, but with higher prices for Scrap and a better demand for rolling mill products these figures may be only temporary. Basic Iron has advanced to \$16 firm with large sales. As a matter of fact, most sellers are inclined to avoid large tonnages until they can see a little further ahead. The range for Philadelphia and nearby deliveries would be about as follows for moderate sized lots:

No. 1 X Foundry.....	\$17.25 to \$17.50
No. 2 X Foundry.....	16.50 to 16.75
No. 2 Plain.....	16.00 to 16.25
Standard Gray Forge.....	14.75 to 15.25
Basic.....	16.00 to 16.25
Low Phosphorus.....	20.50 to 21.00
Southern No. 2 X, rail.....	16.00 to 16.25
Southern No. 2 X, on dock.....	15.50 to 15.75
Southern No. 3.....	14.50 to 14.75
Southern No. 4.....	15.00 to 15.25

Speigeleisen.—There is a good demand, but prompt shipments are hard to secure. Some large sales have been made recently, however, price being about \$27.50 to \$28, c.i.f., for 20 per cent.

Ferromanganese.—There is a scarcity of Ferro for this year's shipments and on spot it would command \$51 to \$52.50 for 80 per cent.; perhaps higher than that for early deliveries. A serious accident occurred at one of the English furnaces which will cause great inconvenience to two or three American Steel works which have contracts for regular shipments from this furnace, which is one of the largest in Great Britain.

Steel.—The market is very strong and quotations are now \$27 to \$27.50 for ordinary Basic Steel and up to \$32 to \$34 for Forging Billets.

Muck Bars.—There is more inquiry and some business has been done at an average of about \$27.50, delivered. One lot for prompt shipment sold at \$28; another at less than \$27.50 for shipment at a later date.

Plates.—There is a stronger demand, a good deal of business coming from Western territory, where the mills seem to be unable to make as good deliveries as some of the Eastern mills. The capacity is very great for the production of Plates, so that it is possible to run in a good deal of

outside business between times. Quotations unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide.....	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under.....	1.63½	1.68½
Flange or Boiler Steel.....	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel.....	1.93½	1.98½
Still Bottom Steel.....	2.03½	2.08½
Locomotive Fire Box Steel.....	2.23½	2.28½
The above are base prices for ¼-inch and heavier. The follow- ing extras apply: Per 100 pounds extra.		
3-16-inch thick.....	\$0.10	
Nos. 7 and 8, B. W. G.....	.15	
No. 9, B. W. G.....	.25	
Plates over 100 to 110 inches.....	.05	
Plates over 110 to 115 inches.....	.10	
Plates over 115 to 120 inches.....	.15	
Plates over 120 to 125 inches.....	.25	
Plates over 125 to 130 inches.....	.50	
Plates over 130 inches.....	1.00	

Structural Material.—It is a repetition of the same old story to define the situation in this department. All the mills are crowded with work, and it is a matter of extreme difficulty to get any deliveries within reasonable time, no matter what prices may be offered. The official prices are as follows, but they have very little meaning under present conditions: Beams and Channels, up to 15 inches, 1.83½c. to 2c., and a tenth more for large sizes, and about the same schedule for Angles.

Bars.—There is a strong demand for Bars, both Iron and Steel, and there are very few mills that will accept the card rate of 1.63½c. A considerable amount of business has been done at 1.73½c., which probably better represents the market than the lower figure.

Sheets.—There is a better demand, and prices are also somewhat stronger. Buyers that have been standing out for concessions are now placing orders, which is a good indication that conditions are improving. We quote: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Old Material.—There is a fairly satisfactory market for Scrap Material, but consumers appear to get all they want without paying higher prices. Holders are very sanguine, however and refuse to look at anything that involves concessions.

Scrap Steel Rails.....	\$16.25 to \$16.50
No. 1 Steel Scrap.....	15.75 to 16.25
Low Phosphorus Scrap.....	21.00 to 22.00
Old Steel Axles.....	21.00 to 21.50
Old Iron Axles.....	25.00 to 25.50
Old Iron Rails.....	22.00 to 23.00
Old Car Wheels.....	15.50 to 16.00
Choice Scrap, R. R. No. 1 Wrought.....	20.50 to 21.00
No. 1 Yard Scrap.....	18.00 to 18.50
Long and Short.....	17.00 to 17.50
Machinery Scrap.....	15.00 to 15.50
Wrought Iron Pipe.....	15.50 to 16.00
No. 1 Forge Fire Scrap.....	15.00 to 15.50
No. 2 Light Ordinary.....	12.00 to 12.50
Wrought Turnings.....	13.75 to 14.25
Axle Turnings, Choice Heavy.....	14.50 to 15.00
Cast Borings.....	10.00 to 10.25
Stove Plates.....	13.00 to 13.50
Grate Bars.....	11.50 to 12.50

Cincinnati.

FIFTH AND MAIN STS., Sept. 20, 1905.—(By Telegraph.)

Pig Iron.—There has been quite a heavy increase in actual business done during the week, which has had the effect of materially strengthening the market and placing it on a solid footing, with an upward tendency prevailing. This does not apply to any particular grade, but affects the entire list, from the lowest to the highest. Inquiry along all lines is reported as exceptionally strong, thought to be the result of urgent recommendation on the part of several of the larger selling agencies that consumers come forward at once and secure Iron needed, as it is anticipated that another advance will be made within the next week or two. The heavy tonnage that has been placed throughout the country during the week has not been without its effect, and the market has been greatly stimulated thereby. Furnaces as a rule are quoting only at advanced prices for next year's delivery, apparent reluctance being shown, however, in naming figures beyond the first quarter. Quite a heavy tonnage of Gray Forge was disposed of during the week, and as a consequence there is not now the pressure on the part of furnaces to sell this grade, although a very generous supply still remains. The price has also stiffened somewhat, and while last week the market was apparently weak at \$10, Birmingham basis, this week we are unable to find any sales having been made below \$10.25. Another encouraging feature is the fact that shipments are moving forward according to contract, which was not the case several weeks since, many consumers ordering same held until the stock they had on hand was consumed. Sales made in this city yesterday of Southern Iron probably aggregated 4400 tons, and at Louisville about 7000 tons, delivery to be made during the six months beginning October 1, at a price of \$11.75, Birmingham. A central Ohio melter bought 2000

tons of Southern No. 2, last quarter delivery, at \$11.50, Birmingham. One thousand tons of Gray Forge brought \$10.50, delivery covering first quarter of next year. Twelve hundred tons of Southern No. 2 was sold to a concern in Indiana on a \$12, Birmingham basis, delivery running through the next six months. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$14.75 to \$15.25
Southern Coke, No. 2.....	14.25 to 14.75
Southern Coke, No. 3.....	13.75 to 14.25
Southern Coke, No. 4.....	13.25 to 13.75
Southern Coke, No. 1 Soft.....	14.75 to 15.25
Southern Coke, No. 2 Soft.....	14.25 to 14.75
Southern Coke, Gray Forge.....	13.00 to 13.50
Southern Coke, Mottled.....	12.75 to 13.25
Ohio Silvery, No. 1.....	15.15 to 15.40
Lake Superior Coke, No. 1.....	15.65 to 15.90
Lake Superior Coke, No. 2.....	15.15 to 15.40
Lake Superior Coke, No. 3.....	14.65 to 14.90

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$17.75 to \$18.25
Lake Superior Car Wheel and Malleable.....	17.75 to 18.00

Coke.—This market is active, and a large supply is in demand. Agents report the usual shortage in rolling stock to handle the tonnage required and delays are being experienced. Prices are holding firm and strong. We quote the best grades of Connellsville Furnace from \$2 to \$2.10 and Connellsville Foundry from \$2.50 to \$2.65, f.o.b. ovens.

Finished Iron and Steel.—There is an increased demand for Structural Plates and Shapes. All of the mills are taken care of for some months ahead and new contracts are constantly coming forward. Prices are unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—The market is quite active and is gradually getting stronger. A number of the mills are said to have an accumulation on hand that will in a short time be exhausted, thereby greatly increasing the demand. A very healthful condition prevails, and a heavy business is looked forward to in the next month of two. Prices are a little higher. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$16 to \$16.50 per net ton; No. 1 Cast Scrap, \$13 to \$13.50 per net ton; Iron Rails, \$19 to \$20 per gross ton; Steel Rails, rolling mill lengths, \$14 to \$14.50 per gross ton; Relaying Rails, 56-lb. and upward, \$23.50 to \$24 per gross ton; Iron Axles, \$21.50 to \$22 per net ton; Car Wheels, \$15.50 to \$16 per gross ton; Heavy Melting Scrap, \$14 to \$14.50 per gross ton; Low Phosphorus Scrap, \$16 to \$16.50 per gross ton.

Cleveland.

CLEVELAND, OHIO, September 19, 1905.

Iron Ore.—The expected drain upon the lake tonnage from the Coal trade has not developed, and boats are abundant for the movement of any quantity of Ore which the shippers seem disposed to send down the lakes. Indications are that the movement in September will be at least as heavy as that of last year, with possibly an increase shown. The one thing which hinders is the possibility that the car supply may not be sufficient for a large direct movement from the boats to the furnace yards. Ore docks are crowded, making it necessary that the movement be direct. With September showing an increase over last year it remains for the shippers to decide whether they prefer to close the season of navigation early in November or continue through the year and pile up Ore on the lower lake docks beyond the possibility of current needs. The rates of carriage remain unchanged at 75c. from Duluth to Ohio ports, 70c. from Marquette and 60c. from Escanaba.

Pig Iron.—A number of producers of Basic, Bessemer and Malleable in this territory report that they are virtually out of the market for the remainder of the year. All the furnaces are in an independent and comfortable position. The market is firm and steady on the basis of \$15 in the Valleys. The Foundry Iron trade is a little dull. Not much buying has been done. Buyers are well satisfied with recent contracts, and furnaces are not looking for business. Some few have sold out for the remainder of the year, and others will not be looking for business for a couple of months. Under the circumstances the market is just steady. Some of the furnaces are disposed to hold for \$15 in the Valleys for No. 2, although the greater number quote \$14.50. The Southern producers are offering some Iron in this territory at \$12, Birmingham, with \$3.85 freight added for Cleveland delivery; this is the equivalent of \$15 in the Valleys for No. 2. The Coke market proves to be stronger, with a good buying movement among both furnaces and

foundries. The shortage of cars is also a feature. Prices have advanced, the best grades of 72-hour Coke being sold at \$2.50 to \$2.75 at the oven and the best grades of furnace Coke bringing \$2 to \$2.25.

Finished Iron and Steel.—The Pipe trade is the one weak spot in the Finished Material market. Even that has shown some improvement in the week, though Pipe mills have been driven to some lengths to get sufficient business lately. The Sheet market is also stronger. Severe cutting of prices is not found, and now about the bottom on sales in car lots at the mill is 2.25c. for No. 28 Black Sheets. Prices of Sheets from stock have been reduced, but without increasing the volume of business to the extent hoped for. Quotations now are based on 2.05c. for No. 10 Blue Annealed, 2.55c. for No. 28 One Pass Cold Rolled and 3.55c. for No. 28 Galvanized. The Structural situation continues strong, and in this territory virtually the only material for sale is coming from the jobbers. Prices have ranged all the way from 2.25c. to 3.25c. The business in sight is constantly increasing. Estimating departments everywhere are busy, and the only question seems to be of getting the material. Reports are heard of a movement on foot in Cleveland to build a new Structural Steel mill, but the plan seems to be only in the incipient stage so far. The association quotation of 1.70c., Pittsburgh, is purely nominal. Several new traction enterprises are developing in this territory, a few of which have sufficient financial strength to carry them through. These will mean ultimately a good Rail tonnage. Some signs of increasing activity appear also in the steam railroads. Premiums of \$2 to \$5 a ton are still being paid on Standard Rails for immediate shipment. Billets are in exceedingly strong demand, and the short supply is causing some concern to the smaller consumers. Prices range from \$26 to \$27, Pittsburgh, with some cases in which higher prices are paid. Most of the Bar Iron mills are comfortably filled with orders for the time being and have withdrawn from the market. The usual price is 1.70c., at the mill, the lower priced material being mostly off the market. Work has been started on a new Bar mill for one of the Cleveland Iron mills. Steel Bars are strong under good buying.

Old Material.—The outlook is better than for several weeks. Many mills have begun to buy, and dealers are unloading stock carried for weeks. Prices are firm, but the upward tendency recently noted has been checked. The following are the prices quoted by the dealers to the trade, gross tons: Old Steel Rails, \$15 to \$15.50; Old Iron Rails, \$20 to \$21; Old Car Wheels, \$16; Heavy Melting Steel, \$15 to \$15.50. Net tons: Cast Borings, \$8.50 to \$9; No. 1 Bushing, \$14; No. 1 Railroad Wrought, \$16; Iron Car Axles, \$21 to \$22; No. 1 Cast, \$14; Stove Plate, \$10.50 to \$11; Iron and Steel Turnings and Drillings, \$10 to \$10.50.

Pittsburgh.

PARK BUILDING, September 20, 1905.—(By Telegraph.)

Pig Iron.—In addition to the purchase of 10,000 tons of Bessemer Iron by the United States Steel Corporation last Saturday at \$15, Valley, for September delivery, the Cambria Steel Company has bought a very large tonnage of Bessemer and Basic, covering its requirements from October to January. There is a very active demand for both Bessemer and Basic and a good deal of inquiry for first quarter and first half of next year, but as a rule furnaces decline to sell into next year at present prices, believing the market will be higher. The minimum price of Bessemer and Basic Iron is \$15, Valley, and it is not likely that any Iron could be bought at less. With the probable heavy future requirements of the Steel Corporation and other large consumers it would seem that even the present heavy output of Iron will be taken up about as fast as made, and a \$15 market for Bessemer and Basic for the balance of this year seems assured. Several large local consumers are in the market for round lots of Foundry Iron, and prices on Northern are distinctly firmer. The Foundry trade away from Pittsburgh is more active than it is here, especially among the smaller foundries, and there has been quite liberal buying. We quote Northern No. 2 Foundry at \$14.75, Valley furnace, but it is possible that on a firm offer and for round tonnage a few sellers would accept \$14.50, at furnace, but this is absolute minimum of the market. There is some inquiry for Forge Iron and the market is a trifle firmer. We quote Northern brands of Forge at \$13.75 to \$14; Valley, equal to \$14.00 and \$14.85, Pittsburgh. A local consumer has bought about 3000 tons of Southern Forge.

Steel.—There is practically a famine in the supply of Billets and Sheet and Tin Bars, which are hard to obtain for prompt delivery at any price. The two leading local Steel makers have turned down in the last two weeks over 30,000 tons of Steel on which they could not make deliveries.

Steel Rails.—The Carnegie Steel Company has booked an order for 24,000 tons of Steel Rails for the Kansas City, Mexico & Orient Railroad.

Coke.—The supply of Furnace Coke for prompt shipment is very scarce and strictly Connellsville Furnace Coke for balance of this year delivery would readily command \$2.40 to \$2.50 at ovens.

Hoops and Bands.—Effective September 15 the Pittsburgh Steel Company, Carnegie Steel Company, Sharon Steel Hoop Company and Atlanta Steel Hoop Company made an advance in Steel Hoops of \$2 a ton, or from 1.65c. to 1.75c., full extras. Bands to be used for strictly coopeage purposes were advanced to 1.75c., and carry full Hoop and Band extras. Bands to be used for other than coopeage purposes remain at 1.50c., base, half extras, as per Standard Steel card, all in carloads, f.o.b. Pittsburgh, plus full tariff rail freight to destination.

(By Mail.)

Never before in the history of the Iron trade have general conditions and the outlook been better than they are now, all signs pointing to the utmost activity for this year and all of next year. In the Pig Iron trade some heavy sales of Bessemer and Basic have been made since our previous report, the United States Steel Corporation having bought 10,000 tons of Bessemer, while the Cambria Steel Company, which has been in the market for some time, has bought a heavy tonnage of both Bessemer and Basic, deliveries running October to January and the price \$15, Valley furnace. There have been other sales of Bessemer and Basic and in the past week 65,000 to 75,000 tons have been sold, the Cambria Steel Company taking the greater part of this tonnage. Stocks of Pig Iron in the two Valleys are steadily decreasing and it looks now as though it might require before long heroic efforts on the part of the large Pig Iron interests, these including the large Steel concerns as buyers and the furnaces as sellers, to control the situation and keep prices within reasonable bounds. It is admitted by both buyers and sellers that \$15, Valley furnace, is a fair conservative price for Bessemer and Basic Iron, affording a good margin of profit to the furnace. Whether the market can be held at this figure remains to be seen, and as stated above it will require concerted efforts to do it. Ore and Coke are the keynotes to the situation in Pig Iron, and it is a question whether enough Ore can be brought down next year to keep the furnaces running. Estimates are made that next year the furnaces will require upward of 35,000,000 tons of Ore, and how to get this vast tonnage down to the docks is the problem that confronts the Pig Iron makers. The United States Steel Corporation has just placed another contract for three Ore boats with the American Shipbuilding Company of Cleveland, which are to be ready for commission when navigation opens next year. Other Steel and furnace interests, such as Jones & Laughlin Steel Company, Shenango Furnace Company and others, are having Ore boats built, and next year will see the largest number of Ore boats on the lakes that there has ever been, many of them with a carrying capacity of upward of 9000 tons each. There has been a heavy inquiry for Foundry Iron in the past two weeks, one interest placing a contract for 10,000 tons of high grade Foundry to be used for special purposes. Prices of Foundry Iron are firmer than for some time, and some sellers have advanced their figures and now quote \$14.75 to \$15, Valley, or 50c. higher than a week ago. There is some inquiry for Forge Iron and prices are a little firmer, but some of the Valley furnaces refuse to sell, believing that prices will be higher. Some sellers now quote \$13.75 to \$14, Valley, for Northern Forge, and are not anxious to sell at these prices. There is a runaway market in Steel and consumers of Billets, Sheet and Tin Bars are having the greatest trouble in getting deliveries of Steel fast enough to keep their mills running. Bessemer and Open Hearth Billets readily command \$25 to \$26 and Forging Billets \$29 to \$30, depending on carbons. Tonnage in all kinds of Finished Iron and Steel, with the exception of Sheets and Tin Plate, is enormously heavy. Prices of Hoops and some gauges of Bands used for coopeage purposes have been advanced \$2 a ton. Furnace Coke for prompt shipment is getting scarce and is held at \$2.15 to \$2.25 at oven for this year delivery. For delivery through the first half of next year nothing less than \$2.50 a ton at oven for strictly Connellsville Furnace Coke is talked of, and it is believed it will bring all of this price. There is a heavy inquiry for Scrap and prices are very firm.

Ferromanganese.—As noted last week, the supply of foreign Ferro is limited and the market is very firm. The Carnegie Steel Company has not been a seller of Ferro for some months and consumers have to depend on foreign altogether. We quote foreign 80 per cent., Ferro at \$51 for large lots.

Steel Rails.—In addition to the heavy tonnage recently placed and noted in this report last week, Eastern and Western roads are in the market for upward of 300,000 tons of Rails, and a good part of this tonnage will be placed before this week is out. The Rail mills are sold up solidly for the balance of this year, and have orders for upward of 1,000,000 tons or more for 1906 delivery. Some excellent records for output of Rails are being made at the Edgar Thomson plant of the Carnegie Steel Company. The Republic Rail mill, at Youngstown, is on Billets temporarily, the concern having Steel orders that it had to fill. The mill will likely be back on Rails in a week or so. The extraordinary activity in Heavy Sections has affected Light Rails,

which are firmer and are held at \$24 to \$28, at mill, depending on weight.

Rods.—In sympathy with prices of Steel Billets Rods are quite firm, and we note a moderate inquiry. We quote Bessemer and Open Hearth Rods \$31 to \$31.50, and Chain Rods \$32 to \$32.50, maker's mill.

Skelp.—The demand for Skelp has been quite active for some time, and the mills are well filled up with tonnage, being somewhat behind in deliveries. With the higher prices for Pig Iron and Steel Billets, both Iron and Steel Skelp are likely to advance. Prices are firm, and for ordinary widths we quote: Grooved Steel Skelp, 1.50c. to 1.55c.; Open Hearth, 1.55c. to 1.60c.; Sheared, \$1 advance; Grooved Iron Skelp, 1.60c. to 1.65c.; Sheared, 1.65c. to 1.70c., maker's mill.

Plates.—We have advices that within ten days or two weeks a leading railroad company will place orders for 32,000 cars for 1906 delivery. The Steel car makers are filled up for the balance of this year and are using an enormous tonnage of Plates. The Pittsburgh Steamship Company, an interest of the United States Steel Corporation, has just placed a contract with the American Shipbuilding Company for three more lake Ore boats, and the Plates and Shapes, upward of 15,000 tons, will be rolled by the Carnegie Steel Company. The tonnage in Plates that is ahead of the mills which will be required for Steel cars and Ore boats is simply enormous and means a congested condition in the Plate mills for some months. Consumers who have not covered will possibly have to pay premiums on Plates before very long, as the leading mills are filled up for four to six months. There is some talk of an advance in price of Plates, but nothing definite has been given out. Prices are exceedingly firm and we quote: Tank Plates, $\frac{1}{4}$ inch thick, $6\frac{1}{4}$ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than $\frac{1}{4}$ -inch to and including 3-16-inch Plates on thin edges.....	\$0.10
Gauges No. 7 and No. 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)...	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel Plates.....	.20
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of $\frac{1}{2}$ of 1 per cent. is allowable. Pacific Coast base, 1.40c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—The L. Vilsack Building, in this city, about 1100 tons, and a large amount of bridge work for the Michigan Central have been taken by the American Bridge Company. Other large contracts are about ready to close and will likely be placed within a week. The American Bridge Company is filling orders for about 7000 tons of Bridge Material from its plant at Ambridge, Pa., for shipment to Japan, to be used in the building of bridges on the Imperial Government Railways in Japan and upon the Keifu Railroad in Korea, which is being rebuilt and extended by the Japanese Government. The material is sent by rail to the Pacific Coast and is then transported to its destination by water. These contracts were secured by the United States Steel Products Export Company, which looks after the export business of the Steel Corporation. Structural fabricators report deliveries from the mills as very unsatisfactory, and several of the leading bridge companies are not taking new work for delivery inside of five or six months. The greatest delay is in Open Hearth Material, on which the mills are three to four months behind. The recent advance of \$2 a ton in prices being firmly held on new business, we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x $\frac{1}{4}$ inch thick up to 6 x 6 inches, 1.70c.; Angles, 8 x 8 and 7 x 3 $\frac{1}{2}$ inches, 1.80c.; Tees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—It would seem that the capacity of the mills for making Sheets is somewhat in excess of the actual demand and has been for some time, which makes the situation in Sheets somewhat disappointing. It is claimed that the Sheet mills which have to buy their Bars and pay close to open market prices for them can hardly get out whole on present selling prices. A report was current last week that Sheets had been advanced \$2 a ton, but this was officially

denied. It is admitted that prices are entirely too low, based on cost of Sheet Bars, but with only a fair demand and the heavy tonnage the mills can turn out there does not seem to be much prospect of higher prices for some time. Prices are only fairly strong and we quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.05c. to 2.10c.; No. 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. Galvanized Sheets are quite firm and we quote: Nos. 22 and 24, 2.75c. to 2.80c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 to \$1.75 per square, and Galvanized Roofing Sheets, No. 28 gauge, at \$2.85 to \$2.95 for 2 $\frac{1}{2}$ -inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—We note a very heavy tonnage in both Iron and Steel Bars and the mills are getting further behind in deliveries right along. On Steel Bars leading concerns like the Carnegie Steel Company and the Jones & Laughlin Steel Company cannot promise deliveries inside of three or four months. There is more or less talk of an early advance of about \$2 a ton in price of Steel Bars, and, while this is probable, nothing definite has been done. We quote Iron Bars at 1.70c., Youngstown, this being the official price of Republic Iron & Steel Company, and which is equal to 1.75c., Pittsburgh. Steel Bars are 1.50c., base, half extras, for carloads and larger lots.

Tin Plate.—The demand for Tin Plate continues quiet, and is in marked contrast with other Finished lines. It is stated that only about 60 per cent. or less of the Tin Plate capacity of the country is active at the present time, owing to dull demand. We quote Tin Plate at \$3.50 to \$3.55, base, terms 30 days, less 2 per cent. off for cash in 10 days, but, as before stated, these prices are being shaded 15c. a box or more by some of the jobbers of outside mills.

Merchant Steel.—This market is in splendid condition, the mills having their order books well filled and having heavy contracts from leading agricultural interests for delivery as far ahead as July, 1906, and specifications on these contracts will soon commence to be placed. Prices are very firm and for current tonnage are as follows: Flat Sleigh Shoe, 1.50c. to 1.55c.; Toe Calk Steel, 2c. to 2.05c.; Smooth Finished Tire, 1.65c. to 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Railway Spring Steel, 1.65c. to 1.70c.; Crucible Tool Steel, 5 $\frac{1}{2}$ c. to 8c. for ordinary grades; special grades, 12c. and upward. Shafting is in fair demand, discounts being 50 per cent. off in carloads and 45 per cent. in less than carloads.

Railroad Spikes.—A fair amount of business is being placed and the mills are well filled up. Prices are firm, except at certain points of delivery where competition is keen and to these points occasional concessions are made. We quote Railroad Spikes at \$1.65 to \$1.70 per 100 lbs., maker's mill.

Spelter.—The situation in Spelter is strong and while prices are more or less uneven they are firm. Ores have advanced and higher prices of Spelter are predicted. We quote prime grades of Western Spelter at 5.65c., St. Louis, equal to 5.77 $\frac{1}{2}$ c., Pittsburgh.

Merchant Pipe.—Conditions in the Merchant Pipe trade are showing improvement and the new tonnage being taken by the mills is larger than for some time. As yet prices show no betterment, but are lower than they have been for some years. Competition among some of the outside mills is said to be responsible for low prices of Pipe, and which concerns that have to buy their Skelp in the open market certainly do not allow a profit. Prices of Merchant Pipe to the larger trade are on the basis of 80 per cent. off the official list. The official discounts to consumers in carloads, which, however, are shaded about 5 points, are as follows:

	Merchant Pipe.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
$\frac{1}{4}$ and $\frac{1}{2}$ inch.....	67	51	65	49
$\frac{3}{8}$ and $\frac{1}{2}$ inch.....	71	59	69	57
$\frac{3}{4}$ to 6 inches.....	75	65	73 $\frac{1}{2}$	63 $\frac{1}{2}$
7 to 12 inches.....	70	55	68 $\frac{1}{2}$	53
Extra strong, plain ends, $\frac{1}{4}$ to $\frac{3}{4}$ inch.....	60	48	58	46
$\frac{1}{2}$ to 4 inches.....	67	55	65	53
$4\frac{1}{2}$ to 8 inches.....	63	51	61	49
Double extra strong, plain ends, $\frac{1}{4}$ to 8 in. 58		45	54	43

Boiler Tubes.—Conditions in the Boiler Tube trade are very satisfactory, the demand being heavy and the mills much behind in deliveries. Prices are very firm, official discounts being rigidly held and are as follows:

Boiler Tubes.		Iron.	Steel.
1 to 1 $\frac{1}{2}$ inches.....		41	44
1 $\frac{1}{2}$ to 2 $\frac{1}{4}$ inches.....		41	56
2 $\frac{1}{2}$ inches.....		46	58
2 $\frac{1}{2}$ to 5 inches.....		53	64
6 to 12 inches.....		41	56

Coke.—With blast furnaces running at present to their maximum capacity and predictions that this country will make 25,000,000 tons of Pig Iron next year, the question arises whether there will be enough Coke to make this Iron.

The Coke situation is certainly very strong and prices firm. At this time strictly Connellsville Furnace Coke for balance of the year delivery is held at \$2.25 to \$2.35 a ton at oven, while for next year \$2.50 a ton at oven is the lowest price talked of, and all signs are that Coke will bring this price. Strictly Connellsville 72-hour Foundry Coke is held at \$2.50 a ton at oven for balance of this year, while on contracts for next year delivery \$2.75 to \$3 a ton at oven are the prices that are likely to prevail. Main Line Furnace Coke for delivery over balance of this year is higher in price, in sympathy with Connellsville, and is held at \$2 to \$2.25 at oven. Foundry Coke made outside the Connellsville region is quoted at \$2.15 to \$2.35, depending on make. The car supply in the Coke regions has been very satisfactory for some months, the railroads supplying all the cars the operators need to move their Coke. Last week the Upper and Lower Connellsville regions turned out about 355,000 tons of Coke, nearly all the plants working full six days. There are 30,289 ovens in the Upper and Lower Connellsville regions and of these only 2481 were idle last week.

Iron and Steel Scrap.—There is more activity in the Scrap trade than for some time, some large inquiries from leading consumers being in the market. With the advancing tendency in prices of Pig Iron it would seem certain that the Scrap market will be higher, and for this reason dealers are holding on to their Scrap, waiting for higher prices. We quote Heavy Melting Scrap, at \$16 to \$16.50 in gross tons, and some dealers who have stocks are not anxious to sell even at the higher price. Other grades of Scrap are very firm and dealers quote as follows: No. 1 Wrought Scrap, \$16; Cast Iron Borings, \$8.50; Bundled Sheet Scrap, \$13.75 to \$14; Cast Steel Scrap, \$15; Machinery Cast Scrap, \$14.50; Old Steel Rails, short pieces, \$15.50; long pieces, \$16, all in gross tons, f.o.b. Pittsburgh.

The Chicago Pneumatic Tool Company.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, recently returned from Europe, where he spent six weeks in the interest of the company's foreign business. While he was abroad the Fraserburgh and Berlin factories were started up and manufacturing arrangements were perfected in Russia. All factories are now running in good shape with sufficient business to keep them constantly occupied for several months, and the outlook generally is the most satisfactory of any period in the history of the company. Mr. Duntley states that the foreign business promises during the next few years to rival the American business. The American factories are all running to their maximum capacity night and day, and although a number of the latest improved automatic machines have recently been installed at each factory they are unable to keep pace with the business offering and further improvements are to be made at an early date.

As usual, Mr. Duntley brought home with him several large orders, including orders for several hundred electric drills. The bulk of the orders for electric drills are coming from fields heretofore impossible to interest in the air tools. While in England and on the Continent several tests were made, with the result that the sample tools demonstrated by Mr. Duntley accomplished the work in a satisfactory manner, far superior to other types of electric drills offered. This branch of the business is now on a substantial basis.

Domestic inquiries are extremely heavy for all classes of tools and appliances, as well as air compressors, as many as 40 compressors being quoted upon in a single day. Several large orders for compressors and tools have been received recently, among which was one for a compressor and complete equipment of pneumatic tools for the Western Steel Car & Foundry Company, Hegewisch, Ill. A total of 157 Franklin compressors have been sold during the past 90 days. It is easily seen that the pneumatic tool business promises well for the balance of the year.

New Use for Sheet Steel.—The Bois Sheet Steel Stair Company, New York, which was recently incorporated to manufacture the Bois sheet steel stairs, for which it has a patent, has taken over an existing plant at 50 Vestry street, where it intends to remain temporarily. The company expects to equip a large plant in the near future, the details of which are not yet obtainable. The stair structure which the company is to build is entirely of sheet steel and is constructed in such a manner that although its weight is reduced to almost one-half

that of other structures of the same dimensions its strength is increased. Any weight brought to bear upon any part of the structure is distributed throughout the entire length of the staircase, including the combined strength of both string pieces. Daniel Petigor is president; John L. Jordan, secretary, and Nathaniel Bois, treasurer.

The American Sheet & Tin Plate Company's Mills.

Below is a list of the sheet and tin plate plants operated by the American Sheet & Tin Plate Company, with the number of hot mills in each plant, capacity per week in gross tons of the sheet mills and capacity per week in base boxes of the tin plate mills:

Sheet Mills.		Capacity per week. Gross tons.
	Number of mills.	
Vandergrift:		
Vandergrift	29 sheet.	2,000
Leechburg	11 sheet.	680
Hyde Park	6 sheet.	370
Saltsburg	4 sheet.	250
Etna-Standard	1 plate. 5 jobbing. 17 sheet.	485 775 1,000
Canal Dover	10 sheet.	600
New Philadelphia	1 jobbing. 9 sheet.	150 475
Canton	5 sheet.	310
Dresden	4 sheet.	250
Guernsey	7 sheet.	460
Mercer	10 sheet.	*650
Midland	7 sheet.	460
Piqua	4 sheet.	225
Old Meadow	8 sheet.	485
Scottdale	9 sheet.	485
Struthers	6 sheet.	360
Wellsville	10 sheet.	650
Wood	1 plate. 12 sheet.	350 500
Totals	176	11,970
Tin Plate Mills.		Capacity per week. Base boxes.
	Number of mills.	
Indiana district:		
American	28	26,000
Anderson	7	6,500
Morewood	8	7,500
Totals	43	40,000
New Castle district:		
New Castle	20	20,750
Shenango	30	31,000
Sharon	20	20,750
Totals	70	72,500
New Kensington Mills:		
Pennsylvania	6	6,000
Pittsburgh	7	7,000
Totals	13	13,000
Pittsburgh district:		
Monongahela	8	15,000
National	25	27,000
Star	8	8,500
United States	11	11,000
Totals	52	61,500
Scottdale district:		
Humbert	6	6,000
Saberton, Morgantown, W. Va.	10	*10,000
Totals	16	16,000
Valley district:		
Chester	7	7,500
Crescent	6	6,500
Falcon	6	6,000
Totals	19	20,000
Wheeling district:		
Cambridge	6	6,000
La Belle	10	10,000
Laughlin	23	21,000
Totals	39	37,000
Grand totals	252	260,000

* Building.

The tin mill at Morgantown, W. Va., was formerly a six-mill plant, but is now known as the Saberton plant and has been placed in the Scottdale district. This plant originally contained six mills, but four are being added, making it a ten-mill plant. The Mercer sheet mill plant at Sharon, Pa., is of the Bray mill type and while it contains only five mills has the capacity of a ten-mill plant.

Lake Iron Ore Explorations.

The New Deerwood Range.

DULUTH, MINN., September 16, 1905.—To-day there are 30 drills working on the new Deerwood or Cuyuna range, called Deerwood from its location, and Cuyuna for what reason I do not know, unless it be an attempt to honor and perpetuate the memory of the man who was first active in the field by incorporating a syllable of his given name in the fanciful nomenclature of the district. Five of these drills are for G. H. Crosby of Duluth; about the same number for the Northern Pacific Railroad; several for Pickands, Mather & Co. and the Shenango Mining Company, who are the only ore people yet sufficiently interested in the district to explore there, and the rest for various explorers and speculators of this city. Mr. Crosby has put down a number of holes across a tract of land and these are said to have proved ore for a width of 1500 feet. The deepest of these holes is 320 feet, of which 200 feet is ore, this being also the greatest thickness of the ore body. His drills have cut into green schist below the ore. This work seems to show, according to those interested, that the formation is a blanket and not a sharply dipping deposit, as was supposed earlier.

The ore shown thus far is on what is called the north range, near Rabbit Lake, in sections 30 and 31, T. 47, R. 27, Crow Wing County, Minn. The formation apparently extends over the town line into section 36 of the adjacent township to the west, 47-28. The main range has been called the south and extends in a northeast and southwest direction from 5 miles south of Rabbit Lake to within a mile of the city of Brainerd. In the north part of T. 45, R. 29, at the center of this range, Pickands, Mather & Co. have been sinking an exploratory shaft and have been greatly troubled by water recently. This week they have succeeded in getting down to the ore and are now able to sink more rapidly. They hope to get out enough of this ore this fall to make a test at furnaces, providing, of course, they find from assays that it is available.

Nowhere else throughout the district is there anything more than drill exploration. This has not shown much ore that is of high value, though the Cuyler Adams work is claimed to have disclosed about 3,000,000 tons of ore, most of which is quite low in iron and all of which carries an excess of both phosphorus and manganese. One or two successes will have the effect of increasing exploration and continuing it for a long time. The district is difficult to explore, as there are no rock exposures and the surface is practically a level swamp and lowlands. Mr. Adams is to lay out a town site near the operation of Pickands, Mather & Co. and will begin the selling of village lots at an early day.

On the Vermillion.

Half a dozen drills are working on the Vermillion range at various points between the northeast corner of Vermillion Lake and the shore of White Iron Lake, the two being 18 miles apart. The most interesting fact connected with that range is that section 30 is to be re-entered. A shaft is to be sunk at once to explore the property more thoroughly than has been possible with drills. Two years ago, when the writer ceased exploration there for F. H. Clergue, he urged upon those taking up the work after him the necessity of exploring by shaft, and told them that the property could never be satisfactorily explored by drills. This he had proved in the three or four months of his own work, and it was in part this fact that caused the cessation of Mr. Clergue's work there.

Until the past few months all the work has been by drills alone. A shaft can be located so as to cut ore at 130 feet, and it can then be followed to depth. It is only by shafts, drifts and cross cuts that the value of this difficult property can ever be proved, in which its exploration differs materially from that of many in the lake region. The story now is that the property has been taken by interests not altogether in harmony with the United States Steel Corporation and that if a large mine is found there it will lead to the construction of a new road along the Vermillion range, probably to some new shipping point, and that a similar campaign to that of James J. Hill on the Mesaba may be undertaken on

the Vermillion. But this is all conjecture, and as to the latter suggestion there is every reason to think it absurd.

Activity on the Mesaba.

Stripping on Mesaba range mines is proceeding with great rapidity, and in the month of August at the Fayal mine 124,000 yards were stripped, the largest amount in any month since the work was begun.

At all the underground mines of this range there has been the utmost activity this week, and stocks are being reduced even more rapidly than was anticipated. These mines have made up for the delays resulting from water at open pit properties in a most astonishing way.

At the Iroquois mine, the property of the Iroquois Iron Company, Chicago, an underground tramming system has just been installed. This mine is a milling property, opened last fall, but its shipments were very small until this season. On the east end of the range Mohawk and Miller mines are quite active and will make good records this year, one in shipments and the other in preparation for next year's output.

The old Mallman exploration, in section 11, 59-14, which has been idle for some time, has been again taken under exploration, this time by the Shenango Company. There is a small amount of good low phosphorus ore in this property, under very light surface, but it is an infinitesimal tonnage at best. All summer long, and for two years before, the local newspapers here have frequently reported large finds in the vicinity of this exploration, or between it and the Duluth & Iron Range Railroad, but none of these have ever made mines, and it is doubtful if there is anything now shown in that section of especial value.

Notes.

Cambria mine, which was afire a month ago, is still out of commission on account of damage done at that time and it will be some weeks before it again hoists much ore.

The operations of the Cleveland Cliffs Iron Company are extending materially and it is taking new mines on old ranges. It has recently added old properties on the western Gogebic and is looking at more. The Jones & Laughlin Steel Company has also added a mine on the western Gogebic and the two large concerns have added much to the interest felt in that district. The Cleveland Cliffs has a very large acreage at Palmer, where the formation is most promising and where ore discoveries of importance may be looked for some time. In the Swanzy vicinity it controls practically the whole region, and it has two mines there as well as much most favorably located land. It is therefore very strong on the Marquette range.

Old Bruce mine, the original copper mine of the lakes, has been reopened and is to be pushed by an English syndicate. It has been an English proposition since it was discovered for a Montreal syndicate in 1846. It was mined until 1864 and produced about \$7,000,000 in copper, but its veins were growing poorer as they went down and finally reached an average of about 3 per cent. The ore is chalcopyrite. A smelter is now to be erected at the property.

D. E. W.

The Driver-Harris Wire Company.—This company, located at Harrison, N. J., at a recent meeting elected F. L. Driver, president and treasurer; F. R. Harris, vice president, and Miss M. C. Harris, secretary. The directors are the officers, together with F. A. Driver, Jas. F. Bless and J. W. Howell. The company has just completed a new building costing \$10,000 that is to be used for offices, shipping room and stockroom. The rapid growth of the business during the past year necessitated this addition. At the same time sufficient extra ground was bought adjoining upon which to erect another building for manufacturing steel wire. According to present plans, this additional improvement will be begun soon after January 1. The company already has a plant of some magnitude. Among the various kinds of wire it manufactures are brass, copper and bronze for weaving purposes, electrical wires of all kinds for use in the making of various electrical apparatus and appliances, and Hercules tinned steel armature binding wire, which is largely used by armature manufacturers and street railway companies.

The Machinery Trade.

NEW YORK, September 20, 1905.

The announcement that the discriminatory import duties levied by Russia on certain classes of American products, including machinery, have been abandoned was pleasing to machinery dealers in this country who pay particular attention to export. Already many machinery houses have received cable orders from their Russian agents, while others are busy strengthening their lines in that country with a view to campaigning for trade. Many agents have wired for shipments of machinery, and it is expected that considerable trade which has lately gone to German and British houses will be diverted to this country. Even with the heavy import duties on their goods American dealers have captured a considerable amount of Russian trade of late. Every branch of the machinery business except the sale of agricultural implements and appliances was affected by the tariff, which specified that machinery, apparatus and models thereof, complete or in parts, adjusted or not; gas and water meters, motors driven by gas, hot air or petroleum; dynamos, sewing machines, knitting machines, portable engines, tenders, fire engines, except locomotives for railroad or ordinary roads, locomotive cars, steam velocipedes and machines not specially mentioned of cast iron, iron or steel, with or without parts of other material, and all sorts of tools were liable to taxation. The trade was generally affected by the tariff, as it can be seen that about everything in the way of machinery was discriminated against. Russia has been a good customer for heavy machinery and oil producing machinery in the past, and it is expected that these lines will be greatly benefited.

It is the intention of many machinery merchants in this city to attend the convention to be held next week in Philadelphia by the American Street Railway Association, at which there is to be quite an exhibit of appliances used in the operation of electric street railways.

New Buildings for Goulds Mfg. Company.

Plans have been completed for the group of new buildings to be erected by the Goulds Mfg. Company, Seneca Falls, N. Y., and work will be commenced very soon on the preparation of specifications for the machinery which is to be installed in the new structures. Both the construction of the buildings and the drawing up of the specifications for the equipment are in the hands of Joseph H. Wallace, Temple Court Building, New York, and it is likely that the purchase of machinery will be made from Mr. Wallace's office. While it has not yet been determined as to the exact amount of machinery that will be purchased, it is stated in a general way that there will be required power plant equipment, several electric traveling cranes, air compressors, pneumatic tools, molding machines, sand blasts, pneumatic hoists, rumbling machines, three cupolas, &c. The main structure of the new group of buildings will be a foundry, 144 x 442 feet, with a gallery running the entire length of one side. This building will be used for making both iron and brass castings and will have concrete and glass side walls. It will be equipped with the most modern machinery, including electric traveling cranes, both in the main span and side bays, and there will be a 100-foot runway extending over the flask storage. The machinery will be electrically driven. The other buildings will comprise a rattling room, 42 x 120 feet; pattern shop, 42 x 130 feet, two stories; power plant, 65 x 103 feet, and pattern storage building, 42 x 114 feet, six stories. These buildings will be of brick construction.

Important Machinery Requirements.

The Mineral Ridge Mfg. Company, Mineral Ridge, Ohio, which is erecting a large machine shop and power house to enable it to engage more extensively in the manufacture of mining machinery, is now receiving bids for the following machinery for equipping its new buildings: One 7-foot vertical boring mill, with housings arranged so that they can be moved back far enough to take 10-foot diameter work if required; one 42-inch vertical boring mill, one horizontal boring mill, with 3½-inch spindle; one key seater to cut key way up to 2 inches, one cold saw to cut 6-inch rounds, one 5-foot radial drill, one 30-inch upright drill, one 26-inch lathe, 15 feet between centers; one universal grinder, similar to Landis No. 2 A, 36 inches between centers; one 20-inch shaper, one No. 2 universal milling machine, one 16-inch toolroom lathe, with taper attachments; one turret lathe, 1¾-inch hole in spindle; one wet tool grinder, with 24 x 3 inch wheels; one hand pipe threading machine to take 6-inch pipe. The mechanical equipment of the buildings is in charge of H. C. Hale, general manager.

Reference is made in another part of this issue to the plant to be erected in Buffalo by the New York State Steel Company, which has just been organized with a capital stock of \$1,000,000. Plans are well along for the new buildings, and it is thought that the company will come into the market for a large quantity of machinery within a short time. The construction of the plant and purchase of machinery is in charge of Spencer Kellogg, president of the company, whose office is in Buffalo, N. Y.

The American Can Company, whose main offices are at

11 Broadway, New York, is preparing to increase its manufacturing capacity in the South by the erection of two large factories. One of the structures will be erected at Savannah, Ga., and another will be built at New Orleans. The two plants are intended to take care of the local demand in the territories in which they are to be situated. No details of the plans for either of the structures have been worked out as yet, but it is intended that the plant at Savannah will be capable of turning out at least 300,000 cans a day, while the New Orleans factory will have a capacity of 500,000 cans a day. The American Can Company maintains its purchasing department in New York, and it is anticipated that the plans for erecting and equipping the plants will be arranged in this city. The company has been a generous patron of the New York machinery market in the past, and only recently a number of substantial orders were placed for a factory the company is having erected on Eighth avenue between Fourteenth and Fifteenth streets. It is understood that the company has adopted a policy of expansion which will entail the erection of other large factories in the near future. It is the corporation's intention to locate factories in various parts of the country to take care of the local demand in certain territories, especially where there are numerous canning industries. The company is having constructed a factory in Lubec, Maine, and buildings are contemplated at other points. The erection of the two Southern factories will entail the purchase of a large amount of machinery, and it is probable that after the plants are completed the Baltimore factory of the company, which is now running at full capacity, will be enlarged, as it is more than busy just now taking care of the local trade, while factories at more remote points have been pressed into service to supply the demand further South.

Among the large mining companies which will soon come into the market for large quantities of machinery is the Oliver Iron Mining Company, Duluth, Minn., which expects this fall to place large orders for both tools for its new shops and steam shovels, locomotives, cars, hoists, electric plants, &c.

The Brunswick-Balke-Collender Company, New York, is having plans prepared for the erection of a large plant in Long Island City and expects within the next few weeks to let contracts for the buildings. The company will require quite a little wood working and other machinery.

Joseph H. Wallace, New York, who is completing the construction and equipment of a paper mill for the Nolton Brothers Paper Company, Watertown, N. Y., is about to send out specifications for two 200-kw. generators and 575 horse-power of alternating current motors to complete the electric equipment of the plant. All of the other machinery has been purchased.

It is expected that the Fagan Iron Works, Hoboken, N. J., will shortly come in the market for quite a little machinery. The company is now rebuilding its large building which was recently destroyed by fire, but as yet has not decided as to what machinery it will have to purchase.

A complete foundry equipment is required by the American Machine Company, Louisville, Ky., which is erecting a new foundry.

Considerable machinery will probably be required by J. Eavenson & Son, soap manufacturers, Philadelphia, Pa., who have purchased from the American Sugar Refining Company the old Segar sugar refinery at the foot of Penn street, Camden, N. J. The plant, which consists of more than six buildings, will be remodeled and the manufacturing facilities of the new owners will be more than doubled. Just what the firm will require in the way of mechanical equipment has not been determined, nor has it been decided whether it will operate the machinery by electricity, using independent motors, or by steam, as heretofore.

Catalogues Wanted.—The Mount Airy branch of the Franklin Mica & Realty Company, Mount Airy, N. C., desires catalogues of steam drills.

Chicago Machinery Market.

CHICAGO, ILL., September 19, 1905.

The week under review has been one of great activity and the buying has been distributed among a very large number of firms. Possibly the largest individual buyer was the Western Electric Company, which has patronized practically all the machinery houses of the city liberally. It has been the policy of this company to purchase machines as its requirements developed, singly or in small groups, rather than to prepare a list of requirements to be figured on by machinery houses.

Conditions are gradually approaching the acute stage of excess of demand over supply that existed three years ago and one of the indications of this situation is the fact that second-hand tools of popular makes in good condition are salable to-day at prices not far below the cost of new in cases where new machines cannot be bought direct from jobbers carrying them in stock. Floors of the machinery

houses are growing barer day by day and the difficulty of securing lathes, drills, boring machines and a host of other tools from the makers is growing greater right along. In some lines March, 1906, is the best date that makers will promise for the shipment of machines ordered to-day from the factory.

A paradox in the power line is the fact that the demand for boilers is very heavy, while engine builders are seeking work. Nearly all the boiler shops in the country are full to their maximum capacity and for the first time in two or three years the boiler manufacturer is able to secure prices for his product that net him an adequate profit. The engine builders have not yet reached this stage and the severe competition between the three largest engine builders is still resulting in prices so low that profits are not what they should be.

Manufacturers of generators, motors and other electrical machines are in somewhat the same shape as the engine builders, as the competition of the giants in the trade is so fierce that prices are badly demoralized. The difficulty of securing prompt shipment of electrical machines, however, is beginning to strengthen the tone of the market and the tendency is at last an upward one rather than downward. Dealers in machinists' supplies and electrical and telephone supplies are extremely busy and their stocks are being greatly reduced by the urgency of present demand. Makers of gas engines and gas producers have, as a rule, more business than they can handle.

The large crops being harvested this fall, following as they do a succession of bounteous crops, have led to a tremendous impetus in the manufacture of agricultural implements and machines. This fact is reflected in enlargements of present plants and liberal purchases of machinery and supplies necessary for such enlargements, as well as in the inauguration of a multitude of new manufacturing projects catering to the agricultural demand. The buying power of the agricultural West is at its maximum and all the industries that look to the farmers as their ultimate consumers are correspondingly prosperous.

The settlement of the Russian-Japanese struggle is greatly stimulating the Asiatic export trade, particularly for industries located along the Pacific Coast. The activities in Panama are reflected in increased business for manufacturers in the United States, particularly those along the Pacific Coast and near the Gulf of Mexico. The advance in the price of oil and the various pipe line projects which have been completed are leading to a renewal of activity in an industrial field that has been extremely quiet until recently.

In the Chicago district the blast furnace and open hearth steel projects which have assumed definite form will call for the expenditure of several million dollars, the purchase of large quantities of machinery and the employment of a large number of operatives. Chicago is becoming more and more a center of the iron and steel industry. Formerly only a distributing point, it has assumed large proportions as a producing center and there are still other projects in a formative state which if completed will greatly add to Chicago's importance as a producing center of iron and steel.

The most important topic in machinery circles just now is the placing of the large list of machine tools, engines and boilers required by the Chicago, Burlington & Quincy Railroad. About eighty per cent. of the total of \$130,000 worth of equipment has been placed and before the close of the present week it is the hope of the purchasing department of the road that the whole list will be cleaned up. Contrary to expectations, the orders were quite generally distributed both to local agencies and the manufacturers direct. Manning, Maxwell & Moore, Marshall & Huschart Machinery Company, McDowell, Stocker & Co. and H. A. Stocker Machinery Company all got orders for a goodly number of machines. Niles-Bement-Pond Company also got a very large order for machine tools. The boilers specified by the road are internally fired with Morison corrugated furnaces and these will be placed with boiler manufacturers who are specializing on that line. Definite details are lacking and will not be obtainable for another week.

The Morden Frog & Crossing Works has bought several large tools for its new plant at Chicago Heights.

The International Harvester Company has also bought miscellaneous requirements and is regularly in the market for machine tools of one kind or another.

The Prescott Company, Menominee, Mich., has bought a considerable portion of its machinery requirements from Chicago firms. This company, as we have previously stated in these columns, is greatly enlarging its plant, including the erection of a large steel casting department which will not only furnish steel castings for the Prescott Company's machines but will become a factor in the steel casting trade.

The Gardner Governor Company, Quincy, Ill., contemplates building an addition to its present machine shop, 120 feet wide by 140 feet long, with saw-tooth roof. The addition will be built of stone in harmony with the balance of the plant and will make the machine shop 400x120 feet in dimensions. The plan has not yet been completed but it

is the company's expectation to have the addition ready for occupancy next spring. The company builds governors, separators, pumping machinery, air compressors and exhaust heads.

The Des Moines Mfg. & Supply Company, Des Moines, Iowa, is just completing a two-story brick building at its plant on East First street which will be utilized in the manufacture of furnaces and heaters. The building is 44x160 feet and will be equipped with a foundry for light castings and specially designed machinery for the heating department. N. S. McDonnell is president and manager of the company and J. E. McDonnell is secretary and treasurer.

The Ohio Mfg. Company, Upper Sandusky, Ohio, is building a large addition to its machine and blacksmith shop and foundry and adding some new machinery. The company, which is a manufacturer of disc harrows, hay presses, land rollers and other farm implements, states that it has orders booked ahead for ten to twelve months.

Philadelphia Machinery Market.

PHILADELPHIA, PA., September 19, 1905.

The local machinery market during the past week has not only held the improvement noted during the previous like period but has made still further gains. The market is now in a very satisfactory shape. Business on the whole is coming out more promptly and there is less difficulty experienced by the sellers of tools and machinery in getting transactions closed up. There has been a good demand for all classes of tools, requirements apparently being about equally distributed between both those of the heavier and lighter types. The greatest drawback to increased business at this time, however, is the inability of manufacturers to furnish tools as promptly as prospective purchasers would like. Prompt shipments are influencing sales to a marked degree. Business which in many instances could have been placed early in the summer and reasonable deliveries obtained was deferred, and not infrequently equally good deliveries are expected when the business is offered at a much later date. Manufacturers, however, have been gradually filling up with work for the past few months and a large proportion of them have now reached a condition where prompt shipments are practically impossible. The larger industrial plants, such as locomotive works, car shops, &c., have for some months had their capacities for the balance of the year fully contracted for, and in some cases now have enough work ahead to keep them busy well into the first half of next year. Machine tool builders are booked ahead on certain lines of tools for periods varying from three to six months. Some tools, however, can still be obtained fairly promptly, but these are fast becoming the exception. Stocks on dealers' floors are rapidly becoming depleted of desirable sizes as well as kinds of tools, and sellers are beginning to find themselves in the undesirable position of having business offered but being unable to accept orders except for extended delivery.

There has been considerable improvement in the foreign demand during the past few weeks. This does not appear to be confined to any particular field, but covers a fairly general line of machinery, tools and general equipment. Quite a good amount of business has been placed in this territory for Japanese delivery, while other countries have also come in for an increased share. Specialties in which there has been a more or less established trade abroad are being taken in better quantities, and on the whole export trade has a much more favorable appearance.

The demand for the smaller engines, boilers, &c., shows improvement. Sales of boilers ranging from 20 to 50 horsepower have increased materially, and while there is a better demand for engines of like capacity, sales have not been as heavy as might be desired by both makers and dealers. Second-hand machinery merchants note an increase in the demand for all classes of tools and machinery, and from present indications look forward to a very satisfactory volume of business during the fall months.

C. J. Matthews & Co., mention of whose extensive additions to their glazed kid manufacturing plant, American and Willow streets, this city, was made in a recent issue of *The Iron Age*, are now in the market for a 400-horse-power right hand Corliss engine, preferably second hand, as well as special leather working machinery for their particular work.

I. H. Johnson, Jr., & Co., Incorporated, has taken on quite a lot of new business. The demand for lathes is good, especially for the larger sizes, and for tools to be designed for special purposes. This company has made some extensive shipments of smaller lathes to the Middle West, while heavy lathes, ranging from 24 to 54 inch, with beds of varying lengths, have been delivered to several of the large steel plants in different parts of the country.

The Hoist Mfg. & Construction Company, builder of cranes, &c., is busy on a lot of good orders. This company finds inquiries good and has recently booked orders for a number of cranes, including one 10-ton and one 5-ton elec-

tric traveling crane, each of 20-foot span, for a nearby party, and a 10-ton hand power traveling crane of 20-foot span for parties in New England.

The Hilles & Jones Company, Wilmington, Del., has had a good demand for its various tools, and considers the prospects for increased business during the remainder of the year very encouraging. Some very satisfactory orders have recently been taken by this company and other important contracts are being estimated upon. This company has recently made some extensive improvements in its compressed air plant, new compressors, &c., being installed, necessitated partly by the increased number of air tools used in its foundry department.

Manning, Maxwell & Moore, through their local branch, note considerable improvement in the general demand for tools, fairly well distributed between those of the heavier and lighter types. Orders for a number of tools, including multiple drills, boring mills, planers, light and heavy lathes, &c., have recently been taken by them for shipment to a party in the immediate vicinity of the city, while a 16-inch boring mill, turret lathe, radial drill and other tools have been shipped different concerns in this territory. Inquiries are reported quite numerous, and from present indications the amount of business transacted during the remainder of the year will be large.

The E. H. Mumford & Co., manufacturer of foundry molding machines, has appointed Jackman & Co., Victoria street, N. W., London, England, its representatives for the sale of power ramming molding machines in Great Britain. The Mumford Company reports a very good amount of orders for its different machines, among which may be mentioned two 26 x 36 inch power draft split pattern machines for Pennsylvania parties; plain power ramming machine for New York parties and two power ramming machines for a local stove foundry. This company is also building ten hinge match plate outfits of an entirely new design for a large Western stove foundry. Inquiries for molding machines for all classes of work are numerous and the prospects for an extensive business during the coming fall months are very good.

The Eynon & Evans Mfg. Company finds both inquiries and orders numerous and all departments of its plant are actively engaged. In the foundry it is particularly busy on a general line of brass and bronze castings. The company also notes good orders for both surface and jet condensers. Steam jet blowers are being furnished a number of the large steel plants, and air valves for floating air in water mains and a large number of special Simplex water meters are being made for a local concern.

The J. G. Brill Company notes an increasing demand for railway cars, particularly from foreign sources. Among recent general orders taken were several for sample cars, one being for the Rio de Janeiro Tramway, Light & Power Company, Bahia, Brazil, the trucks of these cars as well as the general construction being of the regular Brill type. All departments of the Brill Company are exceedingly busy and a large amount of business is now on its books.

The Energy Elevator Company has taken on quite a good amount of new business, out of town orders being largely in excess of those from the local territory. A special hand power freight lift has recently been exported to Brussels, Belgium, while shipments of freight lifts have been made to Hartford, Conn.; Eureka, Cal.; Greenville, N. C., and Calais, Maine. A special book lift is to be installed at Bucknell University, Sunbury, Pa., and two freight lifts will be put in the Majestic Hotel in this city.

Cincinnati Machinery Market.

CINCINNATI, OHIO, September 19, 1905.

A résumé of the summer's work among machine tool builders shows a very satisfactory state of affairs. The truth of the matter is that this has been an exceptional year, and there has been no perceptible difference as regards actual trade between the dull season, as it is generally termed, and that of mid-winter. The shops, almost without exception, are running to full capacity; in fact, a number of them are working into the night to the end that they may make promised deliveries. There appears to be quite a shortage in the line of skilled machinists and placards are to be seen on a number of shops, indicating that they would be pleased to increase present output if the requisite labor could be secured. It is said that during the summer months a number of the men usually employed in the shops and factories of the country seek occupations that give them more outdoor freedom, and that when the cold weather again approaches they return to their old positions, which, in a great measure, supplies the demand. We are not astonished in viewing the present condition of affairs when we take into consideration the almost unprecedented prosperity that is flowing as a mighty wave over the length and breadth of this land. The car shops are busy furnishing equipment to the railroads for hauling the immense crops and other commodities that are now ready for shipment. Rolling mills and steel mills are said to be sold far into the next year and

are quite a factor in keeping up the heavy demand for tools of all kinds. Then, again, there is a very heavy foreign trade that is gradually assuming enormous proportions. We all know that for a number of years Germany has been doing very little buying in this country, and then only along such lines as might be termed specialties. Machine tool builders report quite a change for the better in this respect, and export trade with Germany is showing marked advances over previous years. The same may be said of Italy and one or two other countries of Europe. It is difficult to predict what the result will be with the discriminating duty taken off of Russian shipments. Before this measure was effective millions of dollars' worth of tools were annually shipped into that country from our own city, which is, in a measure, a criterion as to the total amount of business done. In the meantime Japan has not been idle, and a number of orders have been booked and shipments made to that country, which several months since was instrumental in very effectually reducing the stock of nearly every lathe manufacturer in this city. Further expansion is under consideration by one or two of the larger concerns, but matters are not as yet in definite shape and cannot be mentioned.

The John B. Morris Foundry Company has purchased the Rose & Mill radial drill plant. The equipment of the old plant will be removed to the Morris location, where it will continue the manufacture of these tools. The foundry company will probably add a number of new tools, thus giving it much improved facilities over the old concern. The company expects to be in full running order within the next few weeks.

The Cincinnati Machine Tool Company says that trade is very satisfactory and that it is very busy. The company has recently installed a large Norton grinder, on which it is grinding the posts, or columns, used in connection with its drilling machines. This is said to be a method never before attempted in the finishing of these columns and adds greatly to the finish, accuracy and quality of the product, allowing the table arm to operate freely on same. It is also grinding the sliding head, sleeves, spindles and, in fact, all shafts used in the manufacture of its drilling machines, which it considers has increased the value of its product very materially.

The Rahn-Mayer-Carpenter Company says that it has been unable to accumulate any stock on account of heavy trade. Several new tools have been added during the month and more are under consideration. It now has every available foot of floor space in service and has greatly increased facilities over a year ago. Foreign trade is improving and is coming from quarters that have for a long time been quiet.

Greaves, Klusman & Co. have just installed a new planer, 36 x 36 inches by 10 feet, and a 4-foot radial. They now are negotiating for a number of other tools which will be added to their equipment in a short time. This will necessitate the various vise appliances and other accommodations. Trade is said to be the best and increasing.

The Cincinnati Milling Machine Company is now occupying its new extension, which, while not entirely complete, is being utilized in order that the large trade may be accommodated in the best manner possible. Matters have assumed such shape that it is only a question of deliveries, as the company is well taken care of for the future so far as orders are concerned.

Lodge & Shipley Machine Tool Company, Bickford Drill & Tool Company, Schumacher & Boye, R. K. Le Blond Machine Tool Company, the Bradford Machine Tool Company, Smith & Mills, Oesterlein Machine Company, the Hisey-Wolf Machine Company and Drees Machine Tool Company all report an excellent trade, without any special features of interest, and without exception are very sanguine as to the future.

Cleveland Machinery Market.

CLEVELAND, OHIO, September 19, 1905.

Another notch has been added to the limit of size of vessels on the Great Lakes. Yesterday the American Shipbuilding Company of this city closed contracts for two vessels of the 600-foot class. Up to 1900 the 500-foot vessel was only talked of, but that year four vessels of this size were ordered. In 1904 the Augustus B. Wolvin, 500 feet over all, was ordered, and this was looked upon as the limit. Last year the Pittsburgh Steamship Company ordered four vessels that are 9 feet longer, and now the same company, which is the lake end of the United States Steel Corporation, has again raised the limit by ordering two vessels which will be 31 feet longer, 2 feet wider and 1 foot deeper than the "big four." The two new boats will cost about \$450,000 each. They will be 600 feet over all, 580 feet keel, 58 feet beam and 32 feet deep. They will have the same power as the other large boats, triple expansion engines with cylinders 24, 39 and 65 inches, with 42-inch stroke, and they will be fitted with Ellis & Eaves draft under the boilers. The vessels will carry 12,000 tons when loaded for 20 feet of water, or about 1300 tons more than the previous record holders.

The construction and general design will be similar, but they will be heavier and stronger to take care of the increased length. The holds will be built on what is known as the straight side hopper up for a distance of 9 feet. The holds will extend in one continuous length from the collision bulkhead forward to the forward boiler bulkhead aft, with one screen bulkhead in the length of same extending from the tank to the spar deck. In the hoppers there will be no obstructions of any kind, the sides of the vessel and the deck being carried by arch girder construction, which extends from one side of the vessel to the other, about 6 feet deep in the center and spaced every 12 feet apart in the center between the hatches. About 4200 tons of steel will be used in the construction of each vessel. The material will be furnished by the Illinois Steel Company, a branch of the Steel Corporation, as the vessels will be built at the South Chicago yards of the company.

The largest steel vessels ever built in this country are the Minnesota and Dakota, built by the Eastern Steamship Company. They are 630 feet long, 75 feet beam and 38 feet depth. They can be loaded to about 31 feet, which, together with their much greater beam, gives them a capacity of 20,000 tons, as against 12,000 tons for the new lake steamers. These orders give the Cleveland company a total of 20 vessels, all over 500 feet, under contract for 1906 delivery.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has awarded the Sterling Boiler Company, Barborton, Ohio, a contract for 20 boilers of 400 horse-power each. They will be built at the Barborton plant and the Sterling Company is erecting a special building to take care of the work. It will be erected on the site of the present carpenter shop. The boilers will be equipped with mechanical stokers.

The Ohio Machine & Boiler Company, Cleveland, Ohio, has been incorporated by Millard Nelson, Louis L. Spanner, Theodore Closse, W. Rothenberg and others; capital, \$30,000. The company has bought the plant and business of the Union Machine & Boiler Company, River street, and will do marine boiler work largely.

Frank T. Maurath, City Clerk of Newark, Ohio, will receive sealed bids until September 30 for furnishing and installing two 30,000-gallon horizontal compound crank and fly wheel pumping engines, together with the boilers and necessary auxiliaries, valves, hydrants, piping, &c., for additions to the city water works system.

The Brown Hoisting Machinery Company, Cleveland, has closed a contract with the Toledo & Ohio Central Railway for a new fast unloading plant for its docks at Toledo, Ohio. There will be three legs of Brown fast plants, each to be provided with a Brown 5-ton grab bucket. Each plant will have an average capacity of 175 to 275 tons an hour in unloading ore from modern vessels and discharging load into cars or stock piles. Each plant will have an electric man trolley, which requires only one man for its operation. The machines will be similar to those now in use by the Pittsburg & Conneaut Dock Company, at Conneaut, Ohio, which during the past season have averaged 210 to 260 tons an hour, cleaning up 100 per cent. of the load. It is claimed that they are now the fastest plants in operation. Material for the Toledo outfit has been received and it is the intention to have the plant in operation for the opening of navigation next spring.

The Board of Public Service of Toledo, Ohio, will receive bids until October 10 for a complete sand or mechanical filtration plant to have a capacity of 30,000,000 gallons per day. Plans have been prepared by Charles L. Parmelee, consulting engineer.

New England Machinery Market.

WORCESTER, MASS., September 19, 1905.

There appears to be a difference of opinion between manufacturers of engine lathes, who are considering the question of advancing prices, as to whether the increase shall be 5 or 10 per cent. In New England most of the lathe builders, and probably all of them, agree that some increase is necessary because of the greater cost of production. Taking as a basis the price made two years ago, when 10 per cent. was added by vote of the National Machine Tool Builders' Association, the cost has materially increased here in New England. The chief item of additional expense is the price of labor. Conservatively figured, this advance is at least 10 per cent., and some manufacturers employing mechanics put it higher than that. It is simply a case of the demand for labor exceeding the supply. Manufacturers are hiring men one from the other at material increases of wages. It is no uncommon occurrence for an employer of machinists to have one of his men offered 50 or 75 cents a day increase. In one recent case a man was offered \$2.75 when he had been getting \$2. In another a foreman who had been getting \$3 was lured away at \$3.75. In many more instances men are changing their employment because they can get 25 cents more a day elsewhere. The supply is not nearly equal to the demand, a condition more pronounced than has ever been known in New England, it is said. There is a reason for this beyond the fact that the machine shops proper are very busy. Factories making electrical goods,

phonographs, typewriters and various other specialties have grown very rapidly and are employing a good many first-class mechanics. As against the wider field of employment for this class of labor comparatively few apprentices have been or are being trained, and most of the younger generation of mechanics are not thoroughly equipped workmen, the greater part of them being specialists on certain classes of work, but not well trained specialists on a given class of machine. The ordinary young mechanic is not a first-class planer hand, though he may have had his chief training on a planer, nor a first-class lathe hand, though most of his work may have been on a lathe. He has been specialized by his employer on some certain job on a certain machine. This makes his place the harder to fill for the man who has grown to depend upon him for this specialty, but it does not make him so valuable for his new employer. Yet he is at a premium because no better can be obtained. The result, as already stated, is that the average price of labor employed by manufacturers of machine tools is at least 10 per cent. higher. Labor forms a very important item in the cost of machine tools, varying, of course, according to the machine. The greater the cost of the machine in proportion to its weight the greater the proportionate cost of labor. The average cost of an engine lathe may be roughly divided into two-thirds shop maintenance and one-third labor. This may vary, but it is the average set by several manufacturers who were asked for an estimate. The average cost of labor itself, separated from the general shop cost, is perhaps 50 per cent.

As to the cost of materials entering into lathes, the increase as compared with two years ago is about 5 per cent. It may vary in different sections of the country, but probably 5 per cent. is a close estimate for New England. Taking these two general increases into account, 10 per cent. would seem to be nearer the fair thing for the manufacturers than 5 per cent. if they are to sell their machines at the same margin of profit which they received after the last advance.

The committee of the lathe section of the National Machine Tool Builders' Association is considering the question of a general advance in prices as well as the matter of a readjustment of the prices of geared heads and motor driven lathes. It is not expected that the committee will make its report until the next meeting of the National Association. Certainly no definite action can be taken until that time. Probably this meeting will be held in December in New York. There is some feeling that it would be better to call the meeting for October, but the American Society of Mechanical Engineers will meet in December, and the general opinion is that it would be better to have the Machine Tool Builders' meeting at about the same time, that members who wish to attend both meetings may do so in a single trip.

In considering the proposed advance in machine tool prices lathes only have been generally discussed, but similar conditions exist in other lines, and probably the action of the lathe section will be followed by other branches of the trade.

The makers of shapers are reaping the results of the rapid evolution of this type of tool which has taken place in the past few years. The shaper was formerly a low power machine, without great accuracy and was generally employed only for roughing purposes. To-day its more powerful crank and gears afford sufficient power, and better workmanship and design insure greater accuracy, so that for many purposes it replaces the very small sizes of planers which were formerly in much demand. The milling machine has done much in effecting a revolution in the working of the smaller flat surfaces and the grinder has its share. But the shaper's position is more important than ever before as is indicated by the large volume of business on the books of its manufacturers.

The F. R. Patch Mfg. Company, Rutland, Vt., is in the market for the following pneumatic tools: Chipping and rivetting hammers, sand shakers, rammers, air lifts and drills for metal and wood for machine shop and foundry uses.

The Austin Mfg. Company, Hartford, Conn., has been incorporated under Connecticut laws with a capital stock of \$25,000, to continue the business of manufacturing the Austin combination oven and roaster. The company will erect a factory at Berlin, Conn., to enlarge and take care of a rapidly growing business. The plans call for a building 30 x 100 feet and one story with steel truss roof. The company will be in the market for new machines used in sheet metal work, including double cutting circle shear, riveters, punch presses, square shear, bench shear and gasoline engine, as well as shafting, pulleys and belting. The officers are: President, R. M. Austin; treasurer, D. H. Judd; secretary, W. E. Johnson.

The city of New Haven, Conn., will be very materially improved by the expenditure of \$4,000,000 by the New York, New Haven & Hartford Railroad, which will include \$1,250,000 for a new railroad station and \$1,000,000 for widening the "Cut" of the Shore line at this point, converting the line from two to four tracks, an improvement which will affect the entire Shore line system.

Solomon Seam, South Norwalk, Conn., formerly with the G. N. McKibbin Company, has opened a brass finish-

ing shop at 56 Water street, that city, and will instal modern machinery.

The United Shoe Machinery Company, Boston, Mass., is to make a large addition to the foundry of its new plant at Beverly, Mass., the facilities of this department having already become insufficient owing to the increase of business. The new building will be 100 x 150 feet and will be of the same general construction as the remainder of the plant, of reinforced concrete.

The Municipal Water Board, Lawrence, Mass., has instructed its superintendent, M. F. Collins, to investigate the question of an electric lighting plant for the city pumping station, the purpose being to replace gas, which has proved to be very expensive.

In addition to the \$100,000 given by William H. Chapman for the establishment of a manual training school at New London, Conn., it is announced that he is to make another gift for an endowment fund.

It is stated at Hartford that the Association of Licensed Automobile Manufacturers has decided to erect a large automobile testing plant at Hartford. A committee of the association has authority to act in the matter, and, according to the report, it has decided that one large thoroughly equipped station will serve a better purpose than several smaller ones.

The Matheson Motor Car Company, Holyoke, Mass., manufacturer of the Matheson automobile, announces that it is to leave Holyoke and will locate at Wilkes-Barre, Pa., where several sites for a plant are under consideration. The first section of the factory will have about 50,000 square feet of floor space. The plans are now in the hands of Welsh & Sturtevant, Wilkes-Barre, architects. The company is to build for next season a 5-ton commercial vehicle as well as its 40 horse-power touring car. It will continue to operate its present factory until the first of the year, when the new factory will be ready for occupancy. An arrangement has been made for an increase in the capital stock of the company.

Government Purchases.

WASHINGTON, D. C., September 19, 1905.

The Isthmian Canal Commission will soon ask bids on 20 drills without walking beam attachment with a long list of tools to go with each machine to drill 5½-inch holes.

The Isthmian Canal Commission, Washington D. C., will receive bids until October 4, for 800 wood or steel flat cars, nineteen 70-ton steam shovels, six 60-ton extra heavy rapid unloaders and 12 unloading plows.

Sealed proposals will be received at the office of the electrical engineer, United States Reclamation Service, Los Angeles, Cal., until November 1, for one or more alternating current, 900-kw., 25-cycle generators and one or more 100-kw., direct current generators for exciter with switch board, &c., for the Roosevelt power house, Salt River project, Arizona.

The Isthmian Canal Commission, Washington, D. C., will receive bids until September 30, for well drills and appurtenances, magnesia boiler lagging, spiral boiler springs, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 3, for a quantity of supplies for the eastern navy yards, including water tube boiler, pneumatic hammers, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 10, for bilge pumps and other supplies for the Pensacola, Key West and New Orleans navy yards.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, until October 10, for furnishing at the New York Navy Yard and the works of the Fore River Shipbuilding Company, Quincy, Mass.; New York Shipbuilding Company, Camden, N. J., and Newport News Shipbuilding & Dry Dock Company, Newport News, Va., a quantity of elevating, rammer and ammunition hoist electrical equipments.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 17, for a 10-ton locomotive crane for the Boston Navy Yard.

The following bids were opened September 12 for machine tools for the various navy yards:

Bidder 6, American Tool Works Company, Cincinnati, Ohio; 15, Brown & Sharpe Mfg. Company, Providence, R. I.; 18, Bullard Machine Tool Company, Bridgeport, Conn.; 19, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 21, B. F. Barnes Company, Rockford, Ill.; 22, J. W. Cregar Agency, Philadelphia, Pa.; 39, Chicago Pneumatic Tool Company, New York; 45, Drew Machinery Agency, Manchester, N. H.; 50, Fairbanks Company, New York; 55, Fitchburg Machine Works, Fitchburg, Mass.; 63, General Electric Company, Schenectady, N. Y.; 64, Garvin Machine Company, New York; 67, R. W. Geldart, New York; 68, Hendey Machine Company, Torrington, Conn.; 69, Handlan-Buck Mfg. Company, St. Louis, Mo.; 72, Hisey-Wolf Machine Company, Cincinnati, Ohio; 87, I. H. Johnson, Jr., Company, Philadelphia, Pa.;

101, R. K. Le Blond Machine Tool Company, Cincinnati, Ohio; 104, Manhattan Supply Company, New York; 108, Manning, Maxwell & Moore, New York; 112, Morton Mfg. Company, Muskegon Heights, Mich.; 117, Niles-Bement-Pond Company, New York; 119, New Haven Mfg. Company, New Haven, Conn.; 121, C. T. Patterson Company, New Orleans, La.; 123, Prentiss Tool and Supply Company, New York; 124, Pratt & Whitney Company, Hartford, Conn.; 131, Rahn, Meyer, Carpenter Company, Cincinnati, Ohio; 133, Royce & Ricketts, Washington, D. C.; 136, J. B. Roach, Brooklyn, N. Y.; 141, Wm. L. Sargent, Fitchburg, Mass.; 150, Sherman-Brown-Clements Company, New York.

Schedule No. 56.

Class 1. One balanced cantilever crane and trestle—Bidder 10, \$90,000; 84, \$114,148; 122, \$99,267; 167, \$83,975.

Schedule No. 67.

Class 11. One 30-inch planing machine—Bidder 6, \$1185; 64, \$1085; 69, \$1250; 108, \$1015; 117, \$1410; 119, \$1290; 121, \$1025.01; 123, \$1060; 141, \$1070.

Class 12. One 37-inch boring and turning mill—Bidder 18, \$1535; 108, \$1235, \$1385 and \$1558; 117, \$1545; 123, \$1545; 133, \$1710.

Class 13. One horizontal spindle drilling and milling machine—Bidder 121, \$2599.85; 133, \$1950; 141, \$4490.

Class 14. One 5-foot universal radial drill—Bidder 6, \$1175 and \$1265; 69, \$1050; 108, \$1035; 117, \$1275; 121, \$1338; 123, \$1223; 133, \$1150.

Class 15. One 30-inch back geared power feed vertical drill press—Bidder 6, \$273; 21, \$260; 22, \$325; 64, \$248; 69, \$295; 108, \$255; 117, \$442 and \$288; 119, \$409; 121, \$302.33; 123, \$270; 133, \$255; 141, \$297.

Class 16. Two 21-inch vertical drill presses—Bidder 6, \$212; 21, \$168; 22, \$310; 64, \$253; 69, \$284; 108, \$198 and \$146; 117, \$158; 121, \$224.94; 123, \$250; 133, \$160 and \$170; 141, \$286.

Class 17. One 14-inch sensitive drill—Bidder 22, \$47.50; 64, \$50; 104, \$47.75; 108, \$48; 117, \$46; 121, \$78.90; 123, \$63; 133, \$55; 141, \$52.50.

Class 18. One 18-inch universal milling machine—Bidder 15, \$606.75 and \$640.75; 19, \$573; 22, \$545; 64, \$511; 68, \$565; 69, \$560; 101, \$474.47; 108, \$570, \$638 and \$540; 117, \$497; 121, \$568.25; 123, \$627; 133, \$510; 141, \$499.

Class 19. One 16-inch plain milling machine—Bidder 15, \$451.25; 19, \$484; 22, \$455; 64, \$459.40; 69, \$475; 101, \$441.93; 108, \$400 and \$260; 117, \$484; 121, \$383.86; 133, \$300; 141, \$475.

Class 20. One triple geared engine lathe—Bidder 6, \$4392; 22, \$4950 and \$3700; 55, \$5350 and \$7000; 69, \$5500; 87, \$4053; 108, \$4360; 117, \$4886; 119, \$4170; 123, \$4439.

Class 21. One back geared screw cutting machine—Bidder 6, \$1315; 22, \$900; 55, \$1220; 64, \$975; 69, \$1275; 87, \$1098; 101, \$1022.55; 108, \$909 and \$1039; 117, \$1455; 119, \$920; 121, \$1207.13; 123, \$885; 131, \$1084.75; 133, \$1100; 136, \$1210.

Class 22. One back geared screw cutting engine lathe—Bidder 6, \$742; 22, \$820 and \$700; 55, \$630; 68, \$800; 69, \$680; 101, \$626.65; 108, \$690 and \$610; 117, \$659; 119, \$715; 121, \$706.05; 123, \$550; 131, \$964.50; 133, \$660; 136, \$882.

Class 23. Two 16-inch back geared engine lathes—Bidder 6, \$1038; 22, \$810; 55, \$850; 64, \$930; 68, \$1140; 69, \$930; 101, \$941; 108, \$920 and \$1046; 117, \$998; 119, \$874; 121, \$1103.74; 131, \$852.50; 133, \$914 and \$970; 136, \$1106.

Class 24. One back geared engine lathe—Bidder 22, \$310; 64, \$290; 68, \$450; 101, \$347.75; 108, \$330 and \$450; 117, \$360; 133, \$315.

Class 25. One 12-inch tool room lathe—Bidder 64, \$342; 68, \$435; 101, \$374.30; 108, \$460; 117, \$383; 124, \$470 and \$605; 133, \$315.

Class 26. One 15-inch post shaper—Bidder 22, \$285; 64, \$400; 68, \$352; 69, \$315; 108, \$365 and \$320; 117, \$360; 133, \$330 and \$400; 141, \$359.

Class 27. One 48-inch portable keyseating and slotting machine—Bidder 112, \$2200.

Class 28. One 10-inch slotter—Bidder 22, \$1000; 108, \$925 and \$900; 117, \$950; 119, \$841; 121, \$968.85; 133, \$1050.

Class 29. One 2-inch single bolt cutter—Bidder 22, \$370; 45, \$391.50, \$407.50 and \$437.25; 69, \$430; 108, \$360 and \$369; 121, \$406.43; 133, \$385; 141, \$369.

Class 30. One 4-inch pipe threading and cutting machine—Bidder 22, \$675, \$525, \$805 and \$655; 45, \$629; 69, \$650; 104, \$640; 108, \$650; 117, \$490; 121, \$445.02; 133, \$435.

Class 31. One 18-inch double end grinding machine—Bidder 22, \$139; 104, \$145; 108, \$76; 121, \$57.76; 133, \$148; 141, \$138.

Class 32. One 24-inch water tool grinder—Bidder 21, \$94.75; 22, \$175; 69, \$180; 104, \$180; 108, \$79; 121, \$167.75; 141, \$174.

Class 33. One 2-inch twist drill grinder—Bidder 22, \$67.50; 108, \$65; 121, \$67.50; 133, \$63; 141, \$58.

Class 35. Two 20-horse-power electric motors—Bidder 63, \$1024.

Schedule No. 99.

Class 56. Two portable electric drills—Bidder 39, \$135; 50, \$107; 63, \$127; 67, \$117; 72, \$117; 108, \$117; 150, \$94.75.

The following bids were opened by the Isthmian Canal Commission, September 13, under serial number 266 for: Class 1. Precision lathe and other machines; two, threading tool, screw plates, &c.; three, gasoline engine, &c.

Fox Brothers & Co., New York, class 1, \$1313.65; 3, \$807.

Manning, Maxwell & Moore, New York, class 1, \$1201.52; 2, \$107.19; 3, \$918.24.

De La Vergne Machine Company, New York, class 3, \$1813.65.

Columbus Machine Company, Columbus, Ohio, class 3, \$858.40.

Union Gas Engine Company, San Francisco, Cal., class 3, \$1341.96.

C. D. Patterson Company, New Orleans, La., class 1, \$1336.25.

A. Baldwin Company, New Orleans, La., class 3, \$928.47.

Weber Gas & Gasoline Engine Company, Kansas City, Mo., class 3, \$877.35.

Handlan-Buck Mfg. Company, St. Louis, Mo., class 2, \$114.03; 3, \$852.

Hallidie Machinery Company, Seattle, Wash., class 1, \$1157.07; 2, \$133.64; 3, \$808.04.

Model Gas Engine Works, New York, class 3, \$738.99.

Fairbanks, Morse & Co., Chicago, Ill., class 3, \$836.30.

Pape Engineering Company, Baltimore, Md., class 3, \$980.95.

Otto Gas Engine Works, Philadelphia, Pa., class 3, \$960.44.

Under bids opened September 5, for supplies for the various navy yards, schedule 83, class 81, one electric motor was awarded to the General Electric Company, Schenectady, N. Y., \$662; and class 82, four portable ventilating sets, Holtzer-Cabot Electric Company, Brookline, Mass., \$360.

Under bids opened August 10, schedule 255, by the Isthmian Canal Commission, Geo. S. Catt, New York, was awarded contract for two dipper dredges at his bid of \$205,000.

New York Pig Iron Warrant Market.

There was considerable trading in Pig Iron warrant certificates in the Produce Exchange on Wednesday, when 1000 tons of December regular was sold for \$15.60 off call, and the following transactions took place on call: 100 tons, February regular, \$15.80; 100 tons, same, \$15.85, and 200 tons, same, \$15.90. Other transactions during the week ending at noon Wednesday were as follows: 600 tons, Cash regular, \$15.50; 600 tons, October regular, \$15.50; 500 tons, November foundry, \$15.50; 100 tons, September foundry, \$15.50; 100 tons, same, \$15.65. The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	\$15.00	\$15.50		
September	15.15	15.50	15.25	
October	15.25	15.50	15.30	15.75
November	15.30	15.50	15.30	15.80
December	15.40	15.65	15.35	15.90
January	15.40	15.50	15.50	15.90
February	15.50	15.95	15.75	16.00
March	15.50	16.00	15.50	16.00

The New York State Steel Company.—Within a few months there will be a structural steel plant of considerable size added to the group of iron manufacturing plants already located on the outskirts of Buffalo. The New York State Steel Company, which has just been incorporated with a capital stock of \$1,000,000, and which is backed by influential men of Buffalo, N. Y., has purchased 25 acres of ground adjacent to the plant of the Lackawanna Steel Company, where it will erect as soon as possible a plant for the fabrication of steel. The plant will have a daily capacity of 60 tons and will be equipped with modern machinery. It is understood that plans for the buildings are well under way and that construction work can be commenced by November. The site upon which the plant is to be erected has a frontage of 900 feet on the Buffalo River, which connects with Lake Erie and the Erie Canal, and is bounded on one side by the Delaware, Lackawanna & Western Railroad. Connection will be made with the South Buffalo Railroad, which gives the company a connection with every railroad entering Buffalo. It is understood that the

machinery for the plant has not yet been purchased. Spencer Kellogg, president of the Spencer Kellogg Oil Company, whose plant is in Buffalo, is president; A. L. Schultz, who has had many years' experience in the manufacture of structural iron and steel for bridges, is vice-president, and Stuart R. Mann is secretary and treasurer. These officials, with William M. Evarts and Whitney C. Case, constitute the Board of Directors. Among the large stockholders are Samuel M. Clement, president of the Marine National Bank, Henry J. Pierce, president of the International Traction Company, and John B. Larkin, president of the Larkin Soap Company, all of Buffalo.

The La Belle Iron Works.

The annual meeting of the stockholders of the La Belle Iron Works, Steubenville, Ohio, was held in Wheeling, W. Va., last week. The report of operations of the company for the year ending June 30, 1905, was submitted to the stockholders and was regarded as very satisfactory. The report is as follows:

The profit and loss account for the year is as follows:

Gross earnings from operations.....	\$1,186,417.24
Less interest on bonds for 12 months.....	150,000.00

Net earnings for the year.....	\$1,036,417.24
Less amounts appropriated for dividends as follows:	

No. 55, paid May 1, 1905.....	\$103,290.00
No. 56, payable August 1, 1905....	103,290.00
	206,580.00

Net surplus increase for the year.....	\$829,837.24
Add surplus June 30, 1904.....	461,991.92

Total surplus June 30, 1905.....	\$1,291,829.16
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The balance sheet as of June 30, 1905, is as follows:

Assets.	
Property*	\$8,924,019.09
Patterns and patents.....	19,028.78
Treasury stock.....	114,000.00
Suspended bills, accounts and claims.....	32,967.09
Prepaid ore royalties.....	30,038.45
Prepaid interest, insurance and telephone rentals.	3,983.74
Inventory	\$1,295,530.19
Bills receivable.....	52,313.07
Accounts receivable.....	1,143,932.53
Cash on hand and in bank.....	278,312.86
	2,770,188.65
Total current assets.....	\$11,894,175.80

Liabilities.	
Capital stock.....	\$7,000,000.00
Bonded indebtedness.....	2,500,000.00
Pay roll.....	\$68,732.87
Bills payable.....	150,000.00
Accounts payable.....	536,379.63
Accounts payable (new construction estimates approved but not due)....	123,803.54
Dividend No. 56, payable August 1, 1905	103,290.00
Accrued interest.....	26,555.00

Total current liabilities.....	1,008,781.04
Contingent and maintenance funds.....	93,585.60
Surplus account June 30, 1904.....	\$461,991.92
Profit and loss account for year ending June 30, 1905.....	\$1,186,417.24
Less interest on bonds, \$150,000; dividend No. 55, paid May 1, 1905, \$103,290; dividend No. 56, payable August 1, 1905, \$103,290.....	356,580.00

Net gain to surplus for the year..	829,837.24
Total surplus June 30, 1905.....	1,291,829.16

Total liabilities.....	\$11,894,175.80
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* Includes the property of the Pitt Iron Mining Company and the La Belle Coke Company.

The old officers were re-elected, as follows: Isaac M. Scott, president; A. J. Clarke, first vice-president and chairman of board; E. W. Mudge, second vice-president; W. D. Crawford, general manager; H. D. Westfall, secretary; R. C. Kirk, treasurer, and V. B. Higgins, assistant secretary. The old directors were also re-elected, these being as follows: A. J. Clarke, N. E. Whitaker, A. S. List, H. C. Franzheim, A. H. Woodward, I. M. Scott, W. D. Crawford, George Greer, W. S. Foltz, D. J. Sinclair and E. W. Mudge.

Consumers Should Buy Coal

Agreements with Miners of Bituminous and Anthracite Expire April 1, 1906.

BY FREDERICK E. SAWARD.

Consumers of bituminous coal will do well to take in a supply, for if there is to be the least reliance placed on the statements of those in the business there will be a suspension of work at the mines at about the busiest time of the year. It is always well to be forearmed in the matter of coal supply. Already there is to be heard the statement that for New York delivery prices are much better and coal moving far more freely. Lowest prices for South Amboy are strong at \$2.50, an easy advance of 10 to 15 cents over last week. A fair quality of coal at Port Reading moves promptly at \$2.40 and upward, with St. George on about the same level. While railroad yards are full of coal, nearly all of it is sold before arrival, and no heavy offerings are heard of and very little dickering is occurring on sales. New England consumers are taking all of the lower port Hampton Roads coals that are to be had, and complaints of car shortage and detention in loading are increasing daily.

Summer Buyers to Be Congratulated.

In fact, it may be said that soft coal is feeling the impetus of business betterments and the loose ends are being gathered up, so that there will be more uniformity of prices and a better return to the producer. The consumer who had the good fortune to make contracts during the summer months, when the pessimists ruled, has cause for congratulation. The price of labor in many districts was altogether out of proportion to the selling price of coal, and yet in view of prevailing sentiments and greed for orders results might have been no better with a mining rate of 1 cent per ton—all the advantage would have gone to the consumer. In some districts the wage rate is entirely too high compared with even the present price at which coal is selling, and a readjustment is necessary. This and other matters make next year's agreement an important one. The coal operators in granting the miners the eight-hour day had no intention other than of giving a man a full day's pay for eight hours' work. Owing to the lack of organization the operators have not taken care of their interests. The miners, on the other hand, are wideawake and active.

Car Shortage.

Car shortage is getting to be a feature in the soft coal trade, so that one hears of it on every occasion when interviewing the proprietors or the jobbers and dealers. Every year at about this time there is the same report, but as the fuel demands of the country increase it must become more acute. This is so because the carrying companies are conservative in their appropriations for rolling stock. They endeavor to keep up with demand and by adding motive power hope to alleviate the situation. Yet the operator and consumer need more cars to make consumers' conditions more acceptable. Both the Chesapeake & Ohio and the Norfolk & Western railroads are reputed to be in a bad way as respects cars for Western shipment. The Baltimore & Ohio is doing somewhat better, but even in that carrier's coal domain there is some scurrying about to find ample equipment for present needs. The car trouble is undoubtedly spreading, however, and if it becomes general there will be a decided change in the character of the Western market, for the buying is anything but general and provision against scarcity anything but universal.

The Control with Southern Producers.

Southern coals are still the controlling factor in the bituminous situation. Pennsylvania coals cannot compete on a profitable basis at the prices at which these fuels are now quoted. Shippers of the Pennsylvania grades for the most part are holding to prices which represent some margin of profit irrespective of the low figures quoted for the West Virginia product, counting on increasing demand and preference on the part of buyers for the better grades ultimately to take up all

of the tonnage the mines can produce and the railroad companies can handle. No Pennsylvania coal can be mined at a profit at 70 cents, while big tonnages of Southern coals have been contracted for hereabouts, the Southern miners apparently being content to throw profit to the winds. Local miners and shippers are quoting their coals in advance of this figure and leave it to the buyer to "take it or leave it."

The Labor Situation.

Now that it is definitely known that the attitude of the miners on questions connected with the termination of the present agreement next spring will not be determined before November the trade is side tracking interest in the strike problem in favor of more important matters closer at hand. Many in the trade are of opinion that the anthracite operators should anticipate the action of the miners by deciding on a definite action with regard to the questions bound to be raised. The frank announcement of this to the country, with the reasons prompting the decision in advance of the miners' meeting, would go far toward checking labor jingoes, in addition.

Recognition of the union and the eight-hour day are inevitable bones of contention. Many interested in the trade would like to hear long before November a flat declaration for or against these propositions from the leading operators. They would like secrecy, star-chamber methods, mystery, doubt and speculation relegated to the shelf. Many deprecate continued declarations from officials of the great producing companies that "there will be no strike." They would prefer to read that "the producing companies will do thus and so and will do nothing else; the reasons why they will do thus and so are these," followed by details of conditions in the mining regions, of wages, past and present, &c., with every fact that has influence on the situation frankly stated. They believe that the public can be educated to support a "square deal" from operator to miner and not be carried away by sentimental hurrahs. "There may be a strike, but it will be the result of the unreasoning and unreasonable agitation of the demagogue," is about the way they would like to see the statement read.

A leaflet is published by Pratt Institute, Brooklyn, N. Y., describing the new course in industrial chemistry about to be started at that institution. It is a two-year course, planned to meet the growing demand for men to fill the large group of positions intermediate between the chemical engineer and the skilled laborer in manufacturing and chemical plants. About half the time of the student is devoted to chemistry and its applications. He gets in addition mathematics, the principles of mechanics, heat and electricity, mechanical drawing and design of chemical machinery and apparatus. The special feature of the work of the second year is industrial chemistry, in which familiarity is gained with many of the large chemical industries, including sugar, starch, paint, textile dyeing, acid and alkali works.

The Universal Pneumatic Transmission Company, Chicago, has completed in its plant a sample relay line showing the operation of the vacuum tube system in connection with the automatic Dinspel-Stoetzel relays. The installation is provided with only three relays, but these are sufficient to demonstrate the principle involved. The tubes used are 2 3/4 inches in diameter, and the cartridge is given an average speed of 10,000 feet per minute. It is estimated that a 16-inch double tube line from Chicago to Milwaukee, a distance of 82 miles, would require 1200 horse-power and should have about 40 relays. Such a system, it is believed, would be capable of carrying in transit 20,000 pounds of freight continuously at a cost of about 5 cents per hundred pounds for the total distance. The novel feature of this system is that no power is consumed by the pumps except when the corresponding parts of the system are working, as a diaphragm governor automatically throws the power on or off, according to the work required.

PERSONAL.

H. J. Racey, manager of the Orr & Lockett Hardware Company, Chicago, is enjoying a four weeks' vacation on the Pacific Coast.

Wilhelm Funcke, Jr., a partner in a nut, bolt and screw works at Hagen, Westphalia, is visiting plants in this country and studying American methods.

H. Harnischfeger of Pawling & Harnischfeger, Milwaukee, has returned from a two months' visit among the scenes of his boyhood in Germany.

J. E. Thropp, Jr., having completed his engagement with the Nova Scotia Steel & Coal Company, Limited, at Sydney Mines, C. B., in its blast furnace department, has returned to his home at Everett, Pa., to take up some special work at the Everett Furnace of Joseph E. Thropp.

Daniel Guggenheim has been elected president of the American Smelting & Refining Company, to succeed the late Edward W. Nash. He will also perform the duties of the chairman of the Board of Directors, which office has been abolished. S. W. Eccles and C. M. Border were elected vice-presidents. Edward Brush, secretary of the company, is made assistant to the president and will have supervision of all legal matters.

R. R. Shuman, for the last two years Western editor of *The Iron Age* at Chicago, has started in the advertising business on his own account in the Old Colony Building. Mr. Shuman will prepare catalogues and printed matter and write trade paper advertising, specializing along technical lines. He has been succeeded by A. O. Backert, who for the last five years has been manager of the Pittsburgh office of the *Iron Trade Review*.

John W. Dougherty, superintendent of the Pennsylvania Steel Company's Steelton, Pa., works, has returned from a three months' tour of important European iron and steel works.

J. A. Durfee, who has been superintendent of the open hearth department of the Colorado Fuel & Iron Company for a number of years, going to Pueblo from the Otis Steel Company, Cleveland, has accepted the superintendency of the steel works of the Tennessee Coal, Iron & Railroad Company. He will take charge at Ensley on October 1, succeeding Samuel McDonald, resigned.

Edwin R. Kent of Edwin R. Kent & Co., Chicago, has returned from a six months' stay in Europe.

W. S. Doran, formerly associated with the British Westinghouse Electric & Mfg. Company, Ltd., has been appointed manager of the power department of Allis-Chalmers Company, with headquarters at the general offices at Milwaukee, Wis. Mr. Doran became associated with the British Westinghouse Electric & Mfg. Company, Ltd., in 1901. Previous to that he was with the Worthington Pumping Engine Company, Ltd., with headquarters in London, Eng.

John Thomson, of the John Thomson Press Company, New York, will sail within a few days for a short business trip to Paris and London.

C. N. Markle, formerly of the Markle Lead Works of St. Louis, has entered into copartnership with H. M. Sadler to engage in the stock and bond business in New York under the firm name of Markle & Sadler.

Charles E. Graves, assistant secretary of the Republic Iron & Steel Company, Chicago, has resigned to become associated with the Oliver Typewriter Company of that city. Mr. Graves has been intimately connected with the affairs of the Republic Company and was actively engaged in its organization in 1899.

Roger Dowling has been appointed general superintendent of the open hearth steel plant of the Jones & Laughlin Steel Company, South Side, Pittsburgh, to succeed John McConnell, recently resigned. John Drain has been made assistant superintendent.

R. A. Lewis, formerly assistant contracting engineer of the Mesta Machine Company, Pittsburgh, has resigned to accept a position with the United Steel Company, Canton, Ohio.

Robert Bentley, formerly general superintendent of Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, has been elected president to succeed Thomas H. Wells, recently deceased. David Davis has been elected secretary and Richard M. Garlick was made a director to succeed Mr. Wells.

C. W. Sherman of Pittsburgh has been made superintendent of the foundry of the Pratt & Letchworth Company, Buffalo, N. Y., effective October 1.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, has returned from a two months' tour to Europe.

W. C. Morland, secretary of the Jones & Laughlin Steel Company, Pittsburgh, has been elected a director of the Industrial National Bank of that city.

Charles M. Schwab returned from Europe Tuesday.

Nathan A. Taylor of N. & G. Taylor Company, tin plate manufacturer, Philadelphia, returned on the Baltic September 14 from an extended tour abroad. While in England Mr. Taylor spent some time investigating the methods employed at the leading Welsh tin plate works.

F. A. Williams has resigned as secretary and treasurer of the Youngstown Foundry & Machine Company, Youngstown, Ohio, and E. B. Lawrence has been appointed to fill these positions.

The American Sheet & Tin Plate Company, Pittsburgh, makes the following announcements: Howard A. Davis, at present assistant general manager of sales at Pittsburgh, has been appointed manager of sales in Philadelphia district, with offices in Pennsylvania Building, corner Fifteenth and Chestnut streets, Philadelphia, Pa.; T. I. Andrews has been appointed assistant general manager of sales, office on thirteenth floor, Frick Building, Pittsburgh, Pa. These appointments are effective October 1.

Labor Notes.

The regular bimonthly adjustment of the puddling and finishing scales between the Republic Iron & Steel Company and the Amalgamated Association was made last week. It was found from the reports submitted by the Republic Company that the average selling price of iron bars shipped in July and August did not warrant any advance in wages to puddlers or finishers. Puddling remains on the basis of \$5.50 a ton; heating, 60.3 cents a ton; rolling, 41.5 cents a ton; catching, 22.2 cents a ton; roughing down, 18.4 cents, and roughing up, 15.3 cents a ton. These rates will be in effect 60 days from September 1.

The strike of the Amalgamated sheet metal workers of New York, who violated their arbitration agreement by quitting work early in September, was declared off on September 13 pending arbitration. However, the machinery of arbitration was not set in motion, the executive committees of the workers and employers' organizations finding after protracted joint sessions designed to clear away minor differences that they were able to adjust all the matters at issue. The men were given \$4.50 a day, as against \$4 heretofore. An exception was made in the case of the metal ceiling workers, who will be advanced by stages, reaching \$4.50 in one year. The workers not only waived their demand for further restriction of the number of apprentices, but agreed to an increase in the scope of work that may be done by apprentices, according to a contention the employers have made for years. The new agreement cannot be changed before January 1, 1908, and not then unless notice is given by either party prior to June 1, 1907. If no such notice is given it will continue from year to year unless notice is given before June 1 in any twelvemonth. Four associations of employers were included in the settlement, representing, respectively, the master steam and hot water fitters, the metal ceiling manufacturers, the employers of roofers and sheet metal workers and the manufacturers of metal covered doors and windows.

New York.

NEW YORK, September 20, 1905.

Pig Iron.—There has been an active market in Foundry Iron, and while no individual sales amounting to over 2000 tons are reported, there have been many orders placed of 500 and 1000 tons each. It is estimated that the aggregate tonnage is about 30,000 tons, most of which was for delivery during the balance of this year, and comparatively little for delivery into the first quarter of 1906. In the middle of last week one eastern Pennsylvania Steel maker took an additional 2000 tons of Basic Pig, and to-day there has been renewed buying at the higher level of \$16, delivered, recently established. We quote for Northern Iron, at tidewater, \$17 to \$17.50 for No. 1 Foundry, \$16.25 to \$16.75 for No. 2 Foundry and \$15.75 to \$16 for No. 2 Plain. Southern Iron has been more active, on the basis of \$15.75 to \$16 for No. 2, New York harbor. It is estimated that the two leading Alabama companies have sold fully 50,000 tons during the last week.

Steel Rails.—The market continues exceedingly active, and both New England and Southern roads have entered the market. The New York Central had not placed its orders up to this writing, but there have been entered for the Reading road 17,000 tons, for the Jersey Central 3000 tons and for the West Shore 10,000 tons. Among the other orders taken during the week have been 19,000 tons for the Tidewater Railway, 5000 tons for the Cincinnati, Missouri & Louisville, 7500 tons for the Appalachian & Northern, 10,000 tons for the Norfolk & Western, 10,000 tons for the Oregon & Western and 4000 tons for the San Pedro, Los Angeles & Salt Lake Road.

Cast Iron Pipe.—The only development of importance during the week is the stiffening of prices. This is due partly to manufacturers' well filled order books and partly to advancing prices of Pig Iron. Current business continues very satisfactory, although the demand runs almost entirely to lots of moderate size. Carload lots are now quoted on the basis of \$27.50 per net ton for 6-inch, at tidewater.

Finished Iron and Steel.—Few contracts for bridges and buildings have been placed in this territory during the past week. Among those which have come to notice is one for 700 tons for an apartment building taken by a Pittsburgh manufacturer. The outlook in the Structural line is very encouraging, fully 100,000 tons being under negotiation. The bulk of this business is railroad work. While it is possible that some large undertakings included in this total may drag along, most of it is likely to be put in hand within a reasonable time. Mills making Structural Shapes continue crowded with business and orders are being booked for deliveries running up to July, 1906. Other branches of Finished Iron and Steel are in excellent shape so far as order books are concerned, but the outlook is getting less satisfactory for buyers who desire prompt delivery. In such cases premiums must be paid on almost everything. Quotations at tidewater for shipment from mills are as follows: Beams, Channels, Angles and Zees, 1.89½¢. to 1.90½¢.; Tees, 1.94½¢. to 2.04½¢.; Bulbs, Angles and Deck Beams, 1.99½¢. to 2.09½¢.; Sheared Tank Plates, 1.74½¢. to 1.84½¢.; Flange Plates, 1.84½¢. to 1.94½¢.; Marine Plates, 1.94½¢. to 2.04½¢.; Fire Box Plates, 2.04½¢. to 2.60¢., according to specifications; Refined Bar Iron, 1.64½¢. to 1.79½¢.; Soft Steel Bars, 1.64½¢. to 1.74½¢.

Old Material.—The market has shown considerable activity in certain lines, while in others the movement is lagging. Rolling mill stock is very firm, with a number of sales reported of all grades of this class of material and indications are that prices will be higher. Cast Scrap has been moving very freely, with prices advancing. Malleable Cast Scrap is in strong demand, and Car Wheels are quite active. Relaying Rails are scarcer than ever before, although some holders find that buyers are not willing to pay what might be considered fancy prices. The situation is practically unchanged with regard to Steel Scrap. Buyers are holding off, claiming to have what they need for the present. This is, to some extent, confirmed by an embargo which has been laid on shipments to one of the eastern Pennsylvania Steel works. Notwithstanding the position of buyers, Steel Scrap is being strongly held, as it is felt that with the very heavy demand for Steel products the consumption of materials must be increasing at a sufficient rate to absorb all floating stocks in a reasonable time. Quotations for New York and vicinity are approximately as follows in gross tons:

Old Iron Rails.....	\$19.00 to \$20.00
Relaying Steel Rails.....	23.50 to 24.50
Old Steel Rails, re-rolling lengths.....	14.50 to 15.50
Old Steel Rails, short pieces.....	14.00 to 14.50
Heavy Melting Steel Scrap.....	14.00 to 14.50
Old Iron Car Axles.....	20.50 to 21.50
Old Steel Car Axles.....	18.50 to 19.50
No. 1 Railroad Wrought.....	18.50 to 19.50
Iron Trunk Scrap.....	16.50 to 17.50
No. 1 Yard Wrought.....	16.00 to 17.00
Wrought Pipe.....	13.50 to 14.50
Ordinary Light Iron.....	9.50 to 10.50
Cast Borings.....	8.50 to 9.50
Wrought Turnings.....	12.00 to 13.00
Old Car Wheels.....	16.00 to 17.00
No. 1 Machinery Cast.....	14.75 to 15.75
Stove Plate.....	12.00 to 12.50
Railroad Malleable Cast.....	14.00 to 15.00

Metal Market.

NEW YORK, September 20, 1905.

Pig Tin.—Business has been dull, with sales few in number and small in quantity. Prices have for the most part declined during the week, as will be seen from the fact that quotations on the 14th were 32c., on the 15th 31.95c., while on the 18th, although the general asking price was 31.70c., sales were made as low as 31.60c. Some of the lower quotations were due to resales by speculators who felt that the market was declining beyond their depth. On the 19th the market stiffened a trifle to 31.75c. To-day's price is firmer at 32c. for spot stocks, while October is quoted at 31.60c. to 32c. and November 31.50c. to 31.87½¢. In London a similar trend in prices was noted, the lowest quotation on that Exchange being reached Monday, when spot Tin was sold at £145 2s. 6d. To-day the market is firmer at £146 for spot and £145 5s. for futures. The arrivals so far this month are of good size, aggregating 2325 tons. There are afloat for American ports 2980 tons, indicating that the total arrivals for the month of September will be large.

Copper.—There was less animation in the Copper market this week than for some weeks past, but some brokers were able to secure fair sized contracts at the ruling figures of 16c. to 16.25c. for both Lake and Electrolytic. Casting grades are held at 15.75c. Some leaders in the market express the feeling that strength has been shown during the past week in the fact that in spite of the dull business quotations remained practically unchanged. The demand for spot stocks is very small, but in some cases consumers who are compelled to buy have to pay good premiums for prompt deliveries. A story is current that a carload of Electrolytic was sold last week on a basis of 16½¢. for prompt delivery. There is little if any buying being done for consumption during the early months of next year; consequently no quotation accurately represents that future price, but it is believed that consumers can shade the present market at least ½¢. In London the market has been fluctuating between narrow limits and declined about £1 during the week, to-day's spot and future quotations being £69 5s., and Best Selected £74 10s., equivalent to 15.75c., New York. Reports from England and the Continent indicate that buyers there are holding off. The exports during the month have declined considerably, aggregating 11,790 tons.

Pig Lead.—The market is very quiet and not so firm as last week, but the old quotations are unchanged at 4.85c. to 4.90c. In St. Louis the market is dull and slightly lower at 4.72½¢. to 4.75c. bid. The American Smelting & Refining Company continues to quote 4.85c. for shipment lead in 50-ton lots. In London the market is slightly lower at £13 15s. for Soft Spanish Lead.

Spelter.—There has been considerable activity during the week and quotations in New York and St. Louis have had an entirely different trend, the local market being slightly firmer at 5.85c. to 5.95c., while in St. Louis the market was considerably easier at 5.72½¢. The market for Zinc Ores has shown some activity, quotations running up to \$52 per ton for choice brands, while the actual purchases were made on an assay basis at \$47 to \$49 a ton, which is considerably higher than last week. The London market has advanced since our last report and now rules firm at £26 10s.

Antimony.—This metal is quiet and easy, there being no transaction except when buyers are forced to enter the market for immediate needs. Ordinary brands are held at 12½¢. to 13½¢. for Cookson's, and Hallett's is held at 14c. to 14½¢.

Quicksilver.—The price is still held at \$40 per flask of 75 lbs. in 100-flask lots. In San Francisco \$39 is quoted for domestic orders and \$38 for export per flask. The London market is unchanged at £7 2s. 6d.

Nickel.—There is no change in price, large lots being obtainable at 40c. to 45c. and less than ton lots at 50c. to 60c. per lb.

Tin Plate.—The market is dull, and while the official quotations are unchanged at \$3.74 a box for 100-lb. IC Coke Plates, f.o.b. New York, and \$3.55, f.o.b. Pittsburgh, independent producers are shading these prices to the extent of 15c a box. Jobbers in New York have reduced their quotation 15c. a box to consumers. A meeting is being held to-day of the sales agents of the principal producer, which may have some important results. In Swansea Welsh Plates are unchanged, at 11s. 9d.

Accompanying the year book of the Michigan College of Mines, Houghton, Mich., for 1904-1905, is an illustrated pamphlet supplementing the catalogue descriptions of various lines of work at the institution. Views are given of parties of students engaged in railroad work, field surveying, engine testing, geological field work, reporting on power plants and making underground examinations of mines. There are illustrations also of the college buildings and of the various laboratories.

HARDWARE

THE retail Hardware trade and other merchants throughout the country will doubtless be surprised to learn from the letter of our Washington correspondent in this issue that the Fourth Assistant Postmaster-General has taken action of a revolutionary character with regard to the addressing of mail matter for those on rural free delivery routes. It is only fair to assume that the effect of the action taken and the extent to which it stultifies the Department's splendid record for fair dealing in the treatment of the country merchant and the catalogue houses are not appreciated in Washington. Merchants everywhere, however, should lose no time in applying to Postmaster-General Cortelyou to reverse his subordinate's ruling.

The innovation about to be put in force by the Fourth Assistant Postmaster-General is nothing less than an order directing the numbering of letter boxes on all rural routes and instructing postmasters and carriers in the rural service to deliver all mail that may be addressed to a rural box by number only, without the name of the party for whom it is intended. The formal order in regard to the matter is given in full in the letter of our Washington correspondent on another page. The first paragraph of the Department's instructions is as follows:

For public convenience and to facilitate a more accurate handling of mail by rural free delivery carriers, it has been decided that each rural mail box in use on a rural route, which, under the regulations of the Department, is entitled to service, shall be designated by number in the manner and by the method hereinafter set forth; and the delivery by rural carriers of ordinary mail matter of all classes addressed to such boxes by number alone is authorized so long as improper and unlawful business is not conducted thereby.

While as noted below it is contrary to the rules of the postal service for postmasters to give out the names of persons receiving mail on the rural routes there is no regulation forbidding them from stating the number of such routes and the number of boxes on each. Even if this were forbidden the facts could without doubt in most cases be readily ascertained. In order to test the existing conditions in this regard applications for such information have within a few days been made to a number of post offices in various towns and villages from which rural routes emanate, and the information obtained without difficulty. In this way has been demonstrated the facility with which catalogue houses can obtain sufficiently full and definite advices to enable them, after October 1, when the new rule goes into effect, to mail their printed matter to the persons residing on such routes, designating them simply by number and not by name. The matter is far more serious if, as intimated, the formal regulations of the post office order in question are supplemented by official notifications to the postmasters that such information is to be given to those who apply for it.

The sweeping effect of this order and the policy of the Department reflected in it will be seen at a glance. Heretofore the mail order house had been obliged to employ canvassers to go over the rural routes in order to secure the names of residents to whom they desired to send catalogues and other advertising literature. Hereafter it will only be necessary to learn through the postmaster or otherwise the number of routes emanating from a given

office and the number of boxes on each route, and under the new regulation catalogues can be dispatched addressed simply "Box No. 1, Rural Route No. 2, Ironville, Ind.," or "Box No. 10, Rural Route No. 5," and they will be promptly delivered by the rural carriers. In order to reach with their catalogues the ten or twelve million men, women and children now served by rural free delivery routes it will not be necessary for the mail order concerns to know the name of a single individual of that vast number. The Post Office Department has simply perfected an automatic machine by which the mail order houses will be relieved even of the labor of writing full addresses, and under the law recently passed by Congress they can pay postage on their catalogues in bulk and thus avoid the labor of attaching stamps. Altogether, it is doubtful if the most enterprising catalogue house manager in the wildest flights of his imagination ever conceived such a far-reaching, efficient and inexpensive method of reaching the patrons of the rural service.

It is believed that never before in the history of the Post Office Department has an important, time-honored policy been so completely reversed as in this case, for it is obvious that Mr. DeGraw's ruling is far more comprehensive than the confidential order of Machen, which hardly saw the light of day before it was reversed. It is a serious question, in view of the law and regulations, whether Mr. DeGraw has the authority to take this action. The statutes clothe the Postmaster-General only with the power to amend the postal regulations, and yet in Section 549 of these regulations, which has been strictly enforced for many years, we find the following prohibition upon postmasters:

Postmasters must not furnish lists of the names of persons receiving mail at their offices; neither must such information be furnished by members of postmasters' families. When a request for such information is received, accompanied by a postage stamp, such stamp should be returned to the writer, under cover of a penalty envelope, with the information that the regulations forbid furnishing the information desired. Lists of names sent to postmasters for revision must be returned to the senders when postage stamps are inclosed for that purpose; but no new names must be added to the lists.

It is perfectly clear from an examination of the above regulation that the Department has always regarded it as contrary to public policy to make public the addresses of patrons of post offices, and this opinion is emphasized by the extension of the prohibition to members of postmasters' families. More than 12 years ago the Department found it necessary to send a circular couched in peremptory terms to all postmasters, calling attention to this provision of the regulations and stating that "any violation of this rule will subject the offending postmasters to discipline." It is obvious that if postmasters are permitted to furnish applicants with the number of routes radiating from their offices and the number of boxes on each route the spirit of Section 549 is violated and its provisions are completely nullified. It is conceded that the Postmaster-General has authority to amend the regulations, but the Fourth Assistant Postmaster-General cannot legally do so, and it will be remembered that Machen's famous order, which was countersigned by First Assistant Postmaster-General

Wynne, was declared to be illegal and was subsequently rescinded by the Postmaster-General.

Perhaps the most surprising feature of this action of the Fourth Assistant Postmaster-General is the fact that only a few months ago Postmaster-General Cortelyou discovered that his predecessor's instructions prohibiting the posting of the names of patrons of rural routes in post offices were not being obeyed and he forthwith issued an order forbidding postmasters from maintaining public lists of the patrons of routes radiating from their offices and from furnishing any information whatever with reference thereto. While this order was issued by the Postmaster-General, it related to the business of the office of the Fourth Assistant, and was of course brought to the attention of all the principal officials thereof.

In this juncture the trade should immediately send in protests and petitions to the Postmaster-General calling attention to the fact that this new departure is inconsistent with the former policy of the Department; that it is contrary to correct principles of postal administration, and that it puts within the reach of catalogue houses facilities of which they would be sure to avail themselves, to the great injury of the local merchants and of the commercial classes generally.

This is a matter which organizations of the trade, whether representing manufacturing or distributing interests, wholesale or retail, should take up, that in the most vigorous and effective manner the mistake may be brought to the attention of the postal officials with a view to correcting it without delay.

Condition of Trade.

The record of September is already assured as an excellent month characterized by large volume of business, in some sections exceeding even that of previous good years. In many directions the effect of the large demand is felt, and not a few manufacturers have difficulty in making shipments with sufficient promptness to meet the views of merchants. The representatives of jobbing houses and manufacturers are on the road in large numbers and sending in orders obtained without difficulty and covering liberal quantities of goods. The tone of the market continues firm. The advance announced last week on Wire and heavy Wire products has had a good effect not only on this line but also on others as indicating the trend of the market. While manufacturers generally are disposed to be conservative in advancing prices the withdrawal of special discounts or concessions in one form or another is not infrequent. A very confident feeling pervades commercial classes and to this the great crops directly contribute. Such agricultural prosperity as the country is now enjoying is regarded as a sure basis for general well being and already industry and trade are feeling the effect of the satisfactory and promising conditions which prevail. Indications of enterprise on liberal lines are found in practically every section of the country. While there has of late been some complaint of sluggishness in collections the condition in this respect is improved and there is no reason for solicitude in regard to financial conditions.

Chicago.

The actual advance of \$1 a ton in Wire products, as announced last week, has had a beneficial effect in toning up the market, even though, to the uninitiated, the declaration of a base price of \$1.75, Pittsburgh, on Nails appeared to be a decline rather than an advance. As

intimated in these columns last week, Nails have been selling openly and regularly for some weeks past on the basis of \$1.70, Pittsburgh, or 10 cents below the fictitious official price, and this lower price was the basis quite generally of the manufacturers. The advance to the \$1.75 basis on the part of the leading producer is being welcomed by most producers as an opportunity to stop losses, if not to make profits, because the \$1.70 basis represented an actual loss to every Wire mill that had to buy its Rods or Wire in the open market. This same advance of \$1 a ton prevailed throughout the whole Wire list, including Barb Wire, Smooth Fence Wire, &c., and in these products also while the new prices are 5 cents below the former official figure they are 5 cents above the actual figures that prevailed before the advance. The advance did not lead to a very heavy buying movement on the part of jobbers, because jobbers generally had been forewarned and had liberally covered their requirements as far in advance as sellers would permit; but it strengthened the demand upon the jobbers and upon the mills from the retail and the consuming trades. Hardware business would be highly satisfactory if it were not for the fact that manufacturers of most of the staple lines are so far in arrears on their orders that the problem of satisfying the consuming demand is assuming serious proportions. This is particularly true in the case of Builders' Hardware and there are thousands of buildings in the West that are being delayed in completion owing to the difficulty of securing prompt delivery on staple Hardware. With both jobbing and retail trades there is every indication that September, 1905, will surpass all previous records both as to the volume of business booked and the actual deliveries. Word has been passed along the line that Strap and T Hinges are likely to be advanced. Advances are looked upon as inevitable on Black and Galvanized Sheets and materials made from them, because it is known that the present price of Sheets does not pay the cost of manufacture and that there are many Sheet mills that will either have to go out of business or secure better prices. The traditional irregularity in prices and quality of Pipe and Elbows prevails this fall as usual, manufacturers seeking to save themselves from loss on low priced quotations by furnishing lighter and lighter gauges. Demand for Corn Huskers and Knives is unprecedented, though last year it was thought that a business was being done that would not be duplicated for a long time. Even such a little thing as the Corn-Popper has developed a trade that has assumed large proportions and surpasses all previous records. Barn Door Hangers and Fixtures are in such heavy demand that makers, working double turn, are unable to keep up to the requirements of their trade. In fact, outside of Wire products and Sheet Steel, it is hard to name a line of staple Hardware that is not in a congested condition. Cut Nails have not yet been advanced in line with the actual advance in Wire Nails, but higher prices are looked for. The expiration of patents on Coated Nails has led to an increase in the competition on these lines, and unfortunately, in some cases, to a reduction of the weight of the Nails. It was not many months ago that Coated Nails averaged from 85 to 88 pounds to the keg, and now 65 pounds to the keg is said to be frequent, the Nails being made so light that box factories are in some cases abandoning their use.

Philadelphia.

SUPPLER HARDWARE COMPANY.—Since our last letter there has been a noticeable improvement in collections, attributable, no doubt, to the ending of the vacation period. There has likewise been quite an increase in the volume of orders from all sections, showing larger quantities and a decided disposition to replenish.

Noting trade conditions, we had a letter from one of the heads of a large Iron industry some few days ago, in which the opinion was voiced that they look for one of the largest business years they have ever had and that the quantity and quality of their orders were something wonderful. The optimistic feeling regarding the business outlook seems—from what we can learn—to be general and we can see nothing in sight in the business

firmament that would tend to prevent the realization of this feeling. The country has one of the banner crops ever grown, Russia is a third short in her great staples, and the great expansion in the Iron and Steel trade, all indicate a tremendous export trade. Of course it will require an immense amount of money to move the crops, and just now we note that the rate of interest is higher than it has been for some time, but with the return of gold to this country in payment for our cereals and other commodities it will not take long to make the money market easier.

Season goods are moving freely, and out-of-town merchants are beginning to realize that in order to have goods when they want them it is quite necessary to order ahead. We note, with satisfaction, the placing of large orders for freight cars by several of the trunk lines, indicating a preparedness for a large movement of grain and general merchandise. These orders, in our judgment, have not come any too soon, as we have, in all likelihood, been on the brink of a car famine.

There is no change of moment to note in prices with the exception of a slight appreciation in Nails.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Business is running along so smoothly and there is so little of an unusual character that has not been touched upon in the various reports of *The Iron Age* of recent date that it is quite difficult to think of anything of special interest. Salesmen are all at work and business is coming in in satisfactory volume. Orders are of more substantial proportions. Collections also are satisfactory. Prospects for business in the corn growing States, of course, are excellent. So it seems that the "dem'd prosperity" will continue.

We expect on the 25th to have the pleasure of seeing a number of prominent retail merchants and jobbers who will come here to Hotel Jefferson to the meeting of the Catalogue House Committee. We are advised a large number of secretaries of associations in other lines have accepted the invitation to attend the national secretaries' meeting, to discuss the catalogue house question, which will immediately follow the meeting of the Wholesale and Retail Hardware Joint Committee. It is believed this meeting of national secretaries will lead to important results in this catalogue house work.

The writer cannot refrain from referring to some of the criticisms which have recently appeared in the trade press. Honest criticism in the right spirit is a wholesome thing. There are many men of many minds, and it is interesting to see how the same proposition strikes different individuals. It is, however, to be regretted, and it hardly seems fair, that when one man is willing to express his views and assume responsibility for them by writing over his own name others should have the privilege of attacking his views and criticising him personally, at times in somewhat intemperate language, without adding weight to their statements and assuming responsibility for them by signing their own names. It certainly is hardly to be expected that those who write over their own names can be drawn into answering anonymous criticisms. We are told, however, that the exigencies of journalism make it not only proper but even necessary to publish these anonymous communications.

In thinking over this matter in connection with certain things that have been said on the subject of special brands it strikes me that a manufacturer who expresses himself with such indignation on the subject of the identity of the real manufacturer of a line of goods being covered up by a special brand should be just as open in writing his articles, and that, carrying out his idea, he should remember the public will be just as much interested in knowing the authorship of his articles in the trade papers against special brands as they are in seeing his name branded on his own goods. Is it not proper for us, in a friendly and somewhat humorous spirit, to ask this manufacturer who writes such pointed and personal criticisms anonymously on the subject of special brands if it would not be more becoming for him to "brand" his articles in the trade papers with his own name just as he desires to brand his goods? We would

be glad to see manufacturers' opinions bear "manufacturers' brands."

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Our local market reflects the conditions which prevail all over the country. The accumulated wealth, the result of good crops for several years and full prices for farm and other products, is manifesting itself in free expenditures of all kinds. Better tools, more utensils, more liberal house and personal furnishings, education, amusements, —everything comes in for a share of the money, which is more plentiful than the most violent "free silver or bust" advocate of a few years ago would have dared to dream possible. Immense tonnage for transportation is keeping the railroads busy overtime and calling for further equipment and improved terminal facilities.

Hardly a day goes by in this Southern country, now being developed for its timber, mining and oil as well as for its agricultural products, but we hear of some new road project or fresh undertaking of considerable magnitude. Of course much of the capital comes from the North and East for these projects, but there is also an accumulation locally, of no little importance, which takes the initiative or gives a guarantee that the property shall be looked after and developed by more or less home talent. There is an honest effort all over the South, we believe, to make life and property more secure. The commercial spirit rallied at more or less by the professional class is after all a most potent factor in this missionary cause. Even if we have no infidel parts into which to send our spare bishops we put them to work in the home field, cultivating that more assiduously all the time in the full confidence that we are promoting the unity of the nation, consequently a better regard for law and order.

The advances on some of the staple articles, Wire, Nails, &c., are quite in keeping with the general tone of the market. Everybody is busy; everybody wants goods. It will be a great wonder if this fall is not a record-breaker.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Of the many conventions that have been held here this summer that of the National Letter Carriers, which adjourned last week, should result in the most good for the Pacific Coast. These men were cordially met and well taken care of, and as their acquaintance and influence extend to all classes and in every section of the United States the good words that they must speak for us should be like seed sown in good ground and bear fruit accordingly.

The Hoo Hoo are now here in a national convention, which promises to be the most successful ever held by the order. The first day's initiation of new members was the largest in the history of the order, and Black Cats are in evidence in all directions.

The Lewis and Clark Exposition will soon be a matter of history. But little over 30 days remain before the gates will swing open for the last time, and 100,000 lights that have burned so brightly will go out in a gloom that will be more noticeable now that we have accustomed ourselves to their glare and brilliancy. The work, time and money expended by Portland in this enterprise that has done so much for Oregon, Washington and California, 76,000 Eastern tickets already having been validated, should be supplemented by efforts to equal or excel our expenditures on the part of Los Angeles, San Francisco and Seattle, cities all claiming a larger population than we, but none of which has ever had the nerve to undertake a work of the magnitude that has here been carried to a successful and brilliant finish.

Trade begins to show signs of improvement, as had been expected it would as soon as summer was ended. Collections too, now that the harvest has been completed, except the hops, should be nearly a clean up of all past due obligations.

Cleveland.

THE W. BINGHAM COMPANY.—We have nothing special to report at this time except that all the Hardware jobbers here in this district are very busy. Orders are coming in quite freely for well assorted lots of Hard-

ware and supplies of all kinds for immediate use. Orders that were placed early for Stove Boards, Coal Hods, Elbows, Sheet Iron and other lines for fall use are now going forward, and customers may consider themselves fortunate in having bought them early, as we believe we shall be obliged to get more for these goods later on. Merchant Pipe and Fittings, both Malleable, Cast and Brass, are in good demand. Prices are so low that customers should not fear to stock up liberally. The scarcity of the metals from which some of these goods are made would indicate that we must get higher prices than now prevail. On the whole, trade in all lines is quite satisfactory, so much so that it is causing us to work overtime to take care of the business.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—The fall trade is now in full swing and, we believe, is coming up to reasonable expectations. The weather is not as favorable for stacking and threshing as it might be, but still there is opportunity for doing a large amount of work, and the crop is likely to be handled in fair shape. It is now beginning to come to market, and collections already show some effects from it. Reports from the threshers are satisfactory and the probabilities are now that the yields as well as the quality of all kinds of small grain will be good. Corn has been coming along nicely and only a few days more will be required to reach maturity. The crop of upland hay is large, and there will be abundance of feed for live stock. The dairy interests are very prosperous, and the general conditions for business are excellent.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The fall trade is now in full blast and a large volume of business is being done by the jobbers of this city. All of the salesmen are on the road and are sending in nice, well assorted orders. Trade conditions in the South are very satisfactory, with the exception of certain portions in the States of Louisiana and Mississippi, where the yellow fever is still interfering to some extent.

Prices are very firm and strong and a number of advances have taken place recently. The market looks good, and we are of the opinion that higher prices will prevail during the fall and winter months. Collections are very satisfactory.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—The first half of September closes with very satisfactory conditions and excellent prospects. There is a very good volume of current business, as the trade is purchasing with confidence, in view of the general strength of the market and the probability that large stocks will be required to take care of the demand, which is expected to increase with the advance of the season.

The growing corn has so far matured that danger from frosts or any other source may be considered past. It is estimated that the yield will be largely in excess of any previous season, and at present remunerative price the influx of an additional large amount of money in circulation will undoubtedly exercise a very beneficial effect on general trade.

NOTES ON PRICES.

Wire Nails.—The market appears to be in excellent condition, as the result of the action taken in regard to prices by the leading mills last week. Not only are prices maintained, but demand has increased. The probability of difficulty in securing prompt deliveries from mills in the not distant future seems developing into a certainty owing to the volume of current business coupled with the scarcity of steel, car shortage and insufficient terminal facilities. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$1.75
Carload lots to retail merchants.....1.80

New York.—Local business is very active, but terminal facilities are inadequate for requirements. Jobbers

therefore find it difficult to obtain as prompt deliveries as desired. Railroads are also taking a little longer time in getting Nails from mill to destination. New York quotations for small lots from store are on the basis of \$1.95 to \$2.

Chicago.—Prices announced on September 11 by the leading interest cover 60-day requirements only. Practically all of the independent interests are maintaining prices on the new basis. The leading jobbers covered requirements some time ago and the advanced prices named will no doubt greatly facilitate the movement from their warehouses. Official prices are on the basis of \$1.90 in car lots to jobbers and \$1.95 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—The recent action of the leading Wire Nail manufacturers in advancing prices on Wire Nails to \$1.75 minimum in carloads to the large jobbers has had the effect of greatly strengthening the market and concessions have entirely disappeared. In fact the whole Wire Nail market is in better shape than for some time, prices as fixed by the American Steel & Wire Company, the Pittsburgh Steel Company and other leading mills being exceedingly firm, while demand is showing much betterment. The scarcity and high prices of steel, together with the shortage in cars, which is confronting the manufacturers leads to the belief that there may be considerable trouble experienced by the trade before long in getting prompt deliveries of Wire Nails from the mills. We quote Wire Nails at \$1.75 in carloads to the largest jobbing trade, which is the absolute minimum of the market, and \$1.80 in carloads to retailers, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—The announcement of a definite price for Wire Nails is having a beneficial effect on the Cut Nail market. The low prices which have ruled have stimulated buying to a considerable extent and some mills are well filled with contract orders. A meeting of the Cut Nail Association is scheduled for September 27. Quotations are as follows: \$1.60 to \$1.65, base, for carload lots, f.o.b. maker's mill. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are held at about \$1.70, base, in carload lots.

New York.—Demand at this point is seasonable and the market without change. Quotations for small lots from store are on the basis of \$1.90.

Chicago.—The market is firmer than it has been for some time and one large producer this week withdrew a quotation of \$1.70 named to a jobber on a large order. An early advance in Steel Cut Nails is anticipated. Prices are firmly maintained as follows: To jobbers, f.o.b. Chicago, car lots, \$1.75, base; retailers, car lots, \$1.80, base; less than car lots from mill, \$1.90, base; small lots from store, \$2, base.

Pittsburgh.—In all probability the Cut Nail Association will make an advance in price of Cut Nails at its meeting to be held September 27. On account of the low prices ruling for some time demand for Cut Nails has been very active and this, in connection with the high prices and scarcity of steel, would seem to warrant a higher market. We quote Cut Nails \$1.60 to \$1.65, base, in carload lots, f.o.b. maker's mill, an advance of 10 cents per keg being charged for Iron Cut Nails.

Barb Wire.—The announcement of prices which are to be maintained has increased demand and placed the market in an improved condition. It is anticipated that the fall trade will be heavy. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.90	\$2.20
Retailers, carload lots.....	1.95	2.25
Retailers, less than carload lots.....	2.05	2.30

Chicago.—The movement of Barb Wire promises to be unprecedented this season and sales to date have been unusually heavy. Official quotations are as follows: To jobbers, f.o.b. Chicago, car lots, Painted, \$2.05; Galvanized, \$2.35; retailers, car lots, Painted, \$2.10; Gal-

vanized, \$2.40; retailers, less than car lots, Painted, \$2.20; Galvanized, \$2.50.

Pittsburgh.—The agreement recently made by the leading manufacturers to maintain prices absolutely has had a very beneficial effect on the Wire market, which is in better condition in every way than for some time. Demand is increasing and the mills anticipate a heavy fall trade. We quote Painted Barb Wire at \$1.90, and Galvanized at \$2.20 in carload lots to the large jobbing trade, with the usual advance of \$1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or two per cent. off for cash in 10 days.

Smooth Fence Wire.—Improved market conditions extend to Smooth Fence Wire as the result of the prices recently announced. Demand continues active. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads\$1.60
Retailers, carloads1.65
The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

Chicago.—The advance made by the leading interest has been followed by practically all the independents, and the new price is being firmly maintained. Buying continues heavy in anticipation of a heavy fall demand. Quotations to jobbers, f.o.b. Chicago, in car lots, \$1.75; to retailers, car lots, \$1.80.

Pittsburgh.—This market is in better condition than for a long time, the recent schedule of prices adopted by the leading mills being rigidly maintained, and we are advised there is no further cutting in prices. Demand is already quite active, and the mills anticipate a very large fall trade. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads\$1.60
Retailers, carloads1.65

The above prices are for base numbers, 6 to 9.

Brass Cocks.—At the meeting of the Brass Goods Manufacturers' Association, held September 5 and 6, no concerted action was taken in the matter of advancing prices of the Hardware list of Brass Cocks, including Compression, Plain Bibs, Globe, Kerosene, Racking, &c. Individual action has, however, been taken by some manufacturers, who are now quoting 70 and 5 to 70 and 10 and 5 per cent. discount. Other makers have made no change in prices and are still quoting 70 and 10 to 75 per cent. discount.

Axes.—A meeting of the Axe Manufacturers' Association is being held this week in this city, and it is understood that several important questions are under discussion in addition to the matter of fixing prices to take effect October 1. A report has been in circulation that an advance of 25 cents a dozen might be looked for, which would be entirely in accord with the general policy of the association, but there is a feeling in some quarters that Axes are high enough and a maintenance of the price is all that should be expected. As we go to press the manufacturers are still in session, and if they have arrived at a decision it has not been made known.

Rope.—Manufacturers note somewhat of an improvement in demand, owing probably to the stiffening of the market. While no change has taken place in card prices these are not so frequently shaded as heretofore. There is some talk of an advance in prices, but it is improbable that this will take place until card prices are more nearly enforced. General quotations on the basis of 7-16-inch diameter and larger are as follows: Pure Manila, 11 to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound.

Glass.—Additional factories of hand made Glass are slowly going into blast under one or the other of the wage scales, but the process is slow and by no means general.* In comparison with former years there is a large shortage of Glass in stocks on hand. This includes

a number of the sizes most largely used for glazing purposes, and is felt more in the Western than in the Eastern market, as the demand in the former is heavier. The majority of manufacturers of hand made Glass are unwilling to accept contract orders until the basis of cost of manufacture is definitely settled, as far as wages for the coming fire is concerned.

Paints and Colors.—Lead.—The amount of inside and outside painting in this section is larger than usual for this season, and both manufacturers and merchants have difficulty in meeting the requirements for White Lead in Oil. Under these conditions the market is firm in tone. Quotations are as follows: In lots of 500 pounds, or over, 6½ cents per pound; in lots of less than 500 pounds, 7 cents per pound.

Linseed Oil.—Contracts for considerable Linseed Oil have been placed on the basis of 35 cents for Raw, but the weakness of the seed market has arrested placing of contracts as buyers' views are now about 33 cents. The demand for Oil for prompt delivery is excellent and some trouble is experienced in supplying requirements. This scarcity is not likely to be removed until Oil from new seed is on the market. New York quotations for prompt deliveries are as follows: City Raw, 54 to 55 cents per gallon; State and Western Raw, 52 to 53 cents per gallon, according to quantity.

Spirits Turpentine.—The Southern market remains stationary with demand enough to about absorb daily receipts, which are light owing to rainy weather. In the New York market demand has been confined to small lots most of the week under review. Prices have fallen off ½ cent during that time. New York quotations are as follows, according to quantity: Oil barrels, 65 to 65½ cents; machine made barrels, 65½ to 66 cents.

NEAL & BRINKER COMPANY.

IN the reorganization of the business of the Neal & Brinker Company, 18 Warren street, New York, and the establishment of four branches in Greater New York, a number of innovations have been introduced. It will be recalled that at the beginning of the current year this concern arranged to push the sale in this territory of the various articles in Cutlery, Tools, &c., branded "Keen Kutter." In carrying out this plan the Neal & Brinker Company has taken the entire building at 18 Warren street, a total of seven floors, where but three were before occupied. An important feature of this undertaking is the fitting up of a spacious room on the third floor in which meetings will be held at stated intervals of the proprietors, managers of branches, heads of departments and salesmen for mutual discussion of ways and means of expanding and increasing the business. Such a meeting was held for the first time last Saturday afternoon, after which dinner was enjoyed by the 25 participants. In view of the strictly business character of the occasion bringing them together Mr. Neal had the menu printed on the house letter head, thus silently indicating that after all business was the chief function and the dinner merely incidental.

NEW ENGLAND IRON AND HARDWARE ASSOCIATION.

AS usual, the first meeting of the New England Iron and Hardware Association after the summer recess was held at the Point Shirley Club, Boston Harbor, Tuesday, September 19, the association and its guests having the privileges of the club after noon. No business, excepting the announcement of officers and committees for the ensuing year, was transacted, and the occasion was one of social enjoyment, being a reunion of the members preparatory to taking up the serious work of the association during the winter. President Charles F. Bragg came on from Bangor, Maine, and presided. Notwithstanding the dull weather there was a good attendance.

The Johnson & Wyth Company, Cedar Falls, Iowa, is successor to the Cedar Falls Hardware Company, Hardware, heating and plumbing.

AN ORDER OF POST OFFICE DEPARTMENT IN THE INTEREST OF CATALOGUE HOUSES.

FROM OUR WASHINGTON CORRESPONDENT.

WASHINGTON, D. C., September 19, 1905.

THE Post Office Department has issued an order that will raise a storm of protests from the retail merchants who are fighting the catalogue houses. The action just taken is in direct reversal of the Department's policy heretofore enforced. It relates, it will be observed, to the numbering of rural mail boxes and the directions which are given in regard to the delivery of mail matter by the number of the box without regard to the name of the party to whom the mail is to be delivered. The order in question is as follows:

To Postmasters:

For public convenience and to facilitate a more accurate handling of mail by rural free delivery carriers, it has been decided that each rural mail box in use on a rural route which, under the regulations of the Department, is entitled to service, shall be designated by number in the manner and by the method hereinafter set forth; and the delivery by rural carriers of ordinary mail matter of all classes addressed to such boxes by number alone is authorized so long as improper and unlawful business is not conducted thereby.

1. Postmasters at the respective distributing offices are hereby directed to instruct the carriers of all rural free delivery routes which have been operated 60 days or more, to review the rural mail boxes in use on their routes in the interval between the receipt of this order and September 30, 1905, and report which of them conform to the regulations and are thus entitled to designative numbers.

2. The following, when found to be safe, weather proof and fit receptacles for mail, are entitled to numbers:

(a) Boxes "approved" under Order No. 739.

(b) Nonapproved boxes erected prior to October 1, 1902.

3. No nonweather proof or otherwise unfit receptacles for mail shall be numbered. All such must be replaced with regulation "approved" boxes by the owners, or no numbers will be assigned.

No rural mail box erected within the limits of an incorporated city or town or within one-half mile of a post office at an unincorporated town or village shall be numbered unless such box was erected prior to October 3, 1903, or is being served by specific order of the Department.

Service must not be withdrawn, however, from any box now being served until such withdrawal is expressly ordered by this office.

4. The numbers assigned to boxes on each route will commence with "No. 1," which will pertain to the first regulation box reached by the carrier after leaving the starting point of his route, traveling in accordance with official description; box after box thereafter to be counted and given the proper number in regular sequence in order of service from "No. 1," to and including all those boxes entitled to service located on the route.

5. Each number thus arrived at should be recorded in the carrier's roster book opposite the name of the owner of the box so designated, and also opposite the name of every other person entitled to receive mail in said box. Numbers thus applied to boxes and registered must be promptly reported to and recorded by the postmaster of the distributing office to which they belong, and must not be changed thereafter except by specific authority of such postmaster.

6. As soon as possible after completing the assignment of box numbers on a route the postmaster will furnish each box owner with the official number of his box and request that this number be at once legibly and durably inscribed in a conspicuous place on the outside of the box.

7. Boxes served regularly by more than one route must, in cases where such double service is duly authorized, be given numbers in regular consecutive order on each route, by the method prescribed in the preceding paragraphs for numbering boxes served by but one carrier.

8. New boxes erected subsequent to the original numbering, between those already in position on a route and consecutively numbered, will be designated by applying thereto in the regular order the next consecutive numbers shown by the record of numbered boxes already on the route to be unused.

9. The work of numbering boxes on newly established routes must not be undertaken until the great majority are permanently in place. Not less than 60 days should elapse, however, after service begins, before the numbers are assigned.

10. Carriers must keep their roster books corrected up to date. New boxes erected, removals, changes of address, names of new patrons, &c., must be punctually entered up and promptly reported to postmasters. The latter must carefully oversee the work of carriers, and also maintain in their offices accurate and complete lists of the names

and box numbers of all patrons of each route attached to their offices.

11. Any instructions issued by this office conflicting with this order are hereby revoked.

12. On receipt of this communication postmasters will give it the widest possible publicity to patrons of the rural service, without expense to the Department.

Fourth Assistant Postmaster-General.

This order changes, it will be observed, the policy which has been pursued by the Post Office Department and permits the sending of mail of all kinds without the knowledge on the part of the sender of the names of the parties to whom it is to be delivered. Supplementing the above formal regulations the Post Office Department is notifying postmasters in routine correspondence that they must furnish number of routes radiating from their offices and the number of boxes on each route to all applicants. All this is directly contrary to the policy of the Department, which has guarded the names of parties on the free delivery routes, as it permits access to such parties without the trouble of ascertaining or writing their names on their mail matter. It thus affords the catalogue houses and others who desire to circulate miscellaneous printed matter an opportunity for which they have been waiting, but with facilities which make their task much simpler and easier than they had ventured to fancy.

It is a significant fact that the order is issued by the Fourth Assistant Postmaster-General, and it is not unlikely the action was taken on his own responsibility. There is certainly reason for hoping that the order may be withdrawn or modified in such a way as to guard against the evils which it would encourage.

In the absence of the Postmaster-General and the Fourth Assistant there is no one in authority to give an official explanation of the reasons that have moved the Department to take this revolutionary action. It is stated, however, that a weighty consideration with the Department has been the question of added revenues to aid in meeting the big postal deficit. It is understood that Mr. DeGraw's attention was drawn to the fact that the proposed system would result in deluging the rural mails with catalogues and other advertising literature, to which he replied that the Government needed the revenue. In further explanation it is stated that lock boxes in all post offices have for many years been known by number and that postmasters have been under instructions to deliver matter addressed to such boxes by number alone. Of course this has no bearing upon the case in point. Lock boxes are usually maintained by business firms and their renters are about the last class of people the mail order houses would think of reaching with their catalogues.

What the catalogue concern has wanted—and has wanted so badly that efforts have been made to corrupt rural carriers to obtain them—have been the addresses of the millions of thrifty farmers living on the rural routes. This information the Post Office Department now proposes to supply "free, gratis and for nothing," beginning October 1. But an appeal lies from the Fourth Assistant to Postmaster-General George B. Cortelyou, and it is up to the retail merchants of the country to lose no time in taking it.

W. L. C.

GEN. LEVI G. KINGSLEY, the oldest merchant of Rutland, Vt., retired from business on the 1st inst., having disposed of his Hardware store and stock to Henry S. Parker and Richard Ryan, for many years in his employ, who will continue under the style of Parker & Ryan. For nearly 50 years General Kingsley was identified with the Hardware business, which he conducted with much success. General Kingsley also rendered conspicuous service as a soldier and public official and takes with him into his retirement the highest esteem and best wishes of a host of friends in Rutland and throughout the State.

FACTORY COST AND BUSINESS METHODS.

MODERN COMMERCIAL AND INDUSTRIAL ACCOUNTING PRACTICE.

BY HERBERT FOSTER, NEW HAVEN, CONN.

First Article.

THERE is no disputing the fact that this is an age of progress. Arts, science and business all feel its effects, and, with very few exceptions, beneficially. Specialization has become the inevitable standard of endeavor in these modern times, and the need of it has caused men in all paths of life to foster and develop new ideas along certain chosen lines. While numberless progressive methods have been developed and adopted in the processes of manufacture, up to within quite recent times the necessity for advanced ideas in commercial and industrial accounting has not been sufficiently realized; consequently, no very great improvements in methods were made.

Twenty-five or Thirty Years Ago

the manufacturer was able to get good prices for his product—in many cases more than it was worth—and was therefore able to realize handsome profits on his sales. Costs being regarded as inconsequential, his methods for obtaining them were crude. He would get, as nearly correctly as he might see fit, the direct labor on an article, add the cost of material, and then guess at a percentage to be added to cover overhead expenses, or “old horse,” as it was familiarly called, and be satisfied with the result for a cost. This did very well so long as good profits were realized, but with the advent of competitive houses into his field of labor, with possibly the installation by them of improved and, later, automatic machinery, and various other methods, all making for keener competition, the necessity for ascertaining accurate costs and the systematic handling of records began to be realized.

Competent Accountants

were not slow to observe the trend of events and bent their thoughts and energies to the devising of labor saving methods, short cuts, &c., and real progress soon began to be made. It is safe to say that even now the really competent experts, with the necessary knowledge, training and practical business experience, are fewer in number than the demands of modern requirements. Within the past few years departments of commerce, finance and accounts have been founded by several universities, as, for example, Toronto, Columbia and New York. Too much commendation cannot be bestowed for the excellent work done by these schools for the advancement, recognition and upbuilding of the science of accounts, especially that of the last named university. The theoretical knowledge and practical exemplification are of the greatest value, which is attested by the great interest evinced by accountants in taking the course.

In Devising or Adapting a System

of accounting to any business a great many accountants, while endeavoring to hold close to theoretical rules in order to produce the information desired, lose sight of the practical side of the question. In order to be effective and practical in operation it must not be too burdensome or too detailed. It frequently happens that a system is installed, hoping from information obtained thereby to reduce the cost of production; but the man-

ager finds the cost of obtaining the information is greater than any saving he can effect by reducing costs. While it is desirable and necessary to know, the system should neither be too cumbersome in practice nor so costly as to be prohibitive.

At this point the writer feels constrained to add a word in mild protest regarding the ordinary work of subordinates. It has been his experience as well, no doubt, as that of a great many others similarly situated that if you desire work done well or right you must do it yourself or else must arrange to supervise it so thoroughly that you can be assured of its correctness; otherwise a great deal of unreliable information will result, which will serve to discredit the facts presented and make the work ineffective. It is remarkable, but a fact nevertheless, that so many subordinates, through lack of interest in their work or for other reasons, perform it in such a slipshod manner or so incorrectly as to make one feel that all their work is unreliable. They should not, however, be permitted to mar or interfere with the

Trial Balance of PRIVATE LEDGER Nov. 30th.									
ASSETS									
Real Estate & Buildings	50	375	00						
Machinery	124	254	92						
Tools	78	175	90						
Notes Receivable	12	370	50						
Accounts Receivable	372	985	35						
Cash	14	416	53						
LIABILITIES									
Capital Stock						350	000	00	
Surplus						510	908	75	
Notes Payable						180	000	00	
Accounts Payable						33	574	29	
GENERAL ACCOUNTS									
Cash Discount	30	575	15						
Interest and Discount	10	508	01						
Loss and Gain	8	710	96						
Suspense	1	050	10						
Storehouse	25	890	99						
Merchandise	434	899	79						
Material	327	725	75						
Manufacturing Expenses	329	114	43						
General Expenses	11	535	09						
Selling Expenses	106	112	85						
Administration Expenses	42	371	66						
Sales						895	430	19	
Foreign Exchange							257	85	
Reserve on Accts. Rec.						10	901	90	
	1	981	072	98		1	981	072	98

Fig. 1.—A Specimen Trial Balance of Private Ledger.

good work of others, to necessitate the checking of their work for the detection of errors, or to cause suspicion to rest upon results obtained.

Commercial and Factory Accounts.

In describing the system of accounts with which this article has to deal it lends itself naturally to two subdivisions—commercial and factory accounts and the cost of production. It is only just to state that it is the result of several years' conscientious study and practical experiment upon original lines, with the end in view of attaining the maximum of information with the expenditure of the minimum of labor and with the least possible detail. There is necessarily a certain amount of unavoidable detail which to some who are wedded to old methods and dislike any changes, however beneficial, seems appalling. These people, however, should not bar the path of progress. Only a short time since one of these, who fortunately has no authority, but delights in others' concerns, expressed the opinion that the writer's epitaph should read, "He died of too much detail." The

very same week the "detail" to which he referred disclosed a loss in one room which had been going on for years, and as the business increased the loss increased in ratio and would not in all likelihood have been discovered but for this same "detail." The changes in this one room alone which the disclosure caused to be made mean a saving of many thousand dollars each year.

Profit or Loss on Each Line.

In formulating a system of accounting the ideal of business men and accountants alike is one which will monthly present a detailed statement showing the true condition of the business. With the majority of manufacturers there is also another important point which in most cases, is neglected. There are few who confine their productive energies to the turning out of a single

by far the amount it was estimated was used; or possibly the expenditure for labor on a particular line is too great in proportion, thereby calling for a thorough investigation of the various processes of manufacture, which latter, in many instances, can be improved upon; if not, there is the alternative of dropping the line entirely as being altogether unproductive of profit, a measure which, under former conditions, could not have been adopted for lack of specific knowledge. As an instance of the practical results obtained by the system since its installation by the writer it may be stated that, owing to the information it has afforded, one line of manufacture has been entirely discontinued; moreover, it has caused economical changes in methods of production to be made in others which result in the saving of many thousands of dollars annually.

The Key to Whole System

of accounts should be the private, or controlling, ledger. The one designed by the writer consists of a locked book, keys to fit which are given only to the officials and auditor (who makes the entries), thus securing the confidential nature of its contents.

In it are kept all the private accounts of the company and the monthly trial balance, which, as drawn off, presents a monthly statement of the condition of affairs up to that date.

Specimen Trial Balance

Fig. 1 shows a specimen trial balance of the private ledger as for November 30. Its value for comparison where statements for several years have accumulated is apparent. Observe that the private ledger calls for manufacturing expenses, \$329,114.43. By referring to Fig. 2 it will be seen that the heavy faced figures opposite "Manufacturing Expenses" correspond with the amount called for by the private ledger, and the lighter faced figures opposite the respective accounts comprising this group show, in further detail, the accounts which make up this classification (gas, labor, &c.). The same with merchandise, material, general, selling and administration expenses, being a full detail of the controlling accounts in the private ledger.

The "Accounts Receivable" and "Accounts Payable" in this trial balance statement are

the accounts which control, respectively, the ledgers containing accounts with customers and either the voucher book or ledger containing accounts with creditors, as the case may be. These accounts furnish a check upon the bookkeeper's work and prevent any "forcing" of his balance, as, all entries to the accounts on the private ledger being made from the books of original entry, the total balance of his ledgers, Dr. or Cr., must agree with the controlling account. There is likewise no necessity for waiting until the "balance is obtained" before presenting the monthly statement to the officials.

Monthly Recapitulation Page.

Fig. 2 represents the monthly recapitulation page of the department account ledger for November 30. In addition to the total column illustrated there are other columns extending to the right, A, B, C, D, E, unclassified, plating and other manufacturing departments, to which are distributed the figures equaling in amount the figures on the same lines in the total column.

November 30th.	TOTALS				A B C D
Sales				895 450 19	
Foreign Exchange				257 85	
Reserve on Accts. Rec.				10 901 90	
Interest and Discount	10	508	01		
Loss and Gain		8	710 96		
Cash Discount	30	575	15		
Storehouse	25	890	99		
MERCHANDISE:	434	859	79		
Merchandise	405	189	09		
Merchandise Purchased	29	710	70		
MATERIAL:	329	114	43		
Material	109	708	10		
Steel for Manufacturing	205	107	60		
German Silver	12	910	05		
MANUF'G. EXPENSES:	329	114	43		
Fuel, Coal	8	200	09		
Fuel, Oil	1	340	17		
Gas (Soldering)	1	175	10		
Labor for Manufacturing	221	709	70		
Labor, Non-Productive	22	908	52		
Labor for Rep's. & Imp's.	11	910	89		
Manuf'g. Supplies	25	107	17		
Packing & Ship'g. Supplies	27	970	78		
Rep's & Imp's. Supplies	7	317	01		
Water Power	1	475	00		
GEN. EXPENSES:	11	535	09		
Expense, General	6	110	85		
Legal Expense	2	472	00		
Postage	1	710	08		
Stat'y & Office Supplies	1	153	06		
Telegrams & Telephone		109	10		
SELLING EXPENSES	106	112	85		
Advertising	8	570	15		
Agency Expense	48	706	53		
Agents Expense	21	910	10		
Catalogs & Cuts	3	001	01		
Freight & Express Outgoing	11	917	19		
Rent of Agencies	12	008	87		
ADMIN'N EXPENSES	42	371	66		
Insurance	4	705	75		
Salary	34	085	25		
Taxes	3	580	66		
	1	527	444 68		
		906	589 94	906	589 94
		420	854 74		

Fig. 2.—Monthly Recapitulation Page of the Department Account Ledger.

line of goods. For instance, a Hardware manufacturer will make Builders' Hardware, Door Locks, Padlocks, Builders' Tools, Household Utensils. An engineering firm will produce Electrical Machines, Steam Power Machines, Motors, &c. It therefore becomes not a mere matter of interest, but absolutely essential for the life of his business, that the manufacturer may know accurately the amount of profit or loss on each line of goods made.

This is frequently a revelation to the management, showing that just the lines on which it was supposed large profits were being made are perhaps the least profitable, the gains of some lines having concealed the losses of others. It does not always follow that the line using the greatest number of pounds of material will return the greatest profit.

The question, Why is the margin so small? naturally suggests itself. The yearly department report will furnish the answer, indicating, it may be, that the supplies consumed on this particular line of goods exceeded

It will be perceived that the department account ledger contains an analysis of every item of expense connected with the manufacture and sale of goods, together with the sales themselves, all distributed with care to the departments where they belong. These analyses are all obtained from the original entries themselves, thus constituting in itself a complete audit of the essential elements of a business, with the advantage of being continuous and always up to date.

(To be continued.)

DEATH OF EDMUND ORGILL.

THE trade have learned with regret of the death in England of Edmund Orgill, senior member of the Hardware jobbing firm of Orgill Brothers & Co., Memphis, Tenn. Mr. Orgill was born at Rough Park, Staffordshire, England, September 9, 1825. He commenced his business career in a bank at Burton-on-Trent in 1843, where he remained until 1849, when he came to this country and joined his brother in the wholesale package Hardware



EDMUND ORGILL.

business in New York City, representing at the same time the firm of Joseph Tarratt & Son, Wolverhampton, England, who were very large exporters of Hardware, Guns, &c.

In 1854 he moved to Memphis and connected himself with the house of Lownes, Orgill & Co., William Orgill, his brother, having been a member of that firm from its origin in 1847, under the style of R. T. Lamb & Co. Mr. Lamb died of cholera in New York in the year 1849, and the business was continued by Holyoke, Lownes & Co., and it was during this partnership that the concern purchased the property on the corner of Monroe and Front streets which it has since occupied. In 1853 Mr. Holyoke retired from business, and it was continued for one year only by Lownes, Beekman & Co. Mr. Beekman through ill health was obliged to retire and his interest was purchased by Edmund Orgill, the business being continued by Lownes, Orgill & Co. until 1858, when Mr. Lownes retired and the style was changed to Orgill Brothers & Co., which has ever since prevailed.

In 1897 the firm was incorporated with the following officers: Edmund Orgill, president; Frederick Orgill, vice-president; Joseph Orgill, treasurer; William Orgill, secretary. Mr. Orgill was a man of high character and ability, with personal qualities which endeared him to many, by whom he will be sincerely mourned.

Fire recently destroyed the store and stock of Minkler & Harrison, Princeville, Ill., causing a loss of about \$14,500, which was largely covered by insurance. The firm has resumed business and will rebuild at once.

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CHICAGO HARDWARE SPECIAL TO WASHINGTON CONVENTIONS.

THE annual meetings of the American Hardware Manufacturers' Association and the National Hardware Association will be held in Washington, D. C., November 8, 9 and 10. Following the custom which has prevailed for a number of years, a special train will be run from Chicago. The present plan is to leave Chicago Sunday, November 5, at 11 a.m. over the Pennsylvania road, reaching Washington at 11 a.m. Monday, when the visitors will pay their respects to President Roosevelt. Entertainment *en route* will be provided as usual. W. H. Bennett, 40 Dearborn street, Chicago, is the efficient chairman of the committee in charge of the Chicago Special, and he requests that parties desiring to have reservations on that train communicate with him at once.

In addition to the Arlington and Shoreham hotels, which as noted in our last issue will be headquarters of the National Hardware Association for the annual convention, the association has also secured accommodations at the Hotel Normandle, which is just across from the Arlington. Members of the association and others intending to be present at the meeting are urged to communicate without delay with F. P. May of F. P. May & Co., Washington, who has charge of the rooming of the visitors.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate.

FROM OTTO AGRICOLA, Gadsden, Ala., who is refitting his store and will add to his stock a line of Shelf Hardware, Paints and Sporting Goods.

FROM M. M. & C. A. WILKINS, who have opened a retail Hardware store in Everly, Iowa.

FROM NORFOLK HARDWARE COMPANY, Norfolk, Va., M. E. Sewell, president, which has lately been incorporated to conduct a wholesale and retail Hardware business.

FROM O. T. REYNOLDS & Co., Dover, Tenn., who have bought the Shelf and Heavy Hardware, Stove, Implement, Paint and Sporting Goods business of J. M. Allen & Co.

FROM BLOOM & LAURITSON, who have engaged in the Hardware business at Loomis, Neb.

FROM J. E. BRIGGS LABOR SAVING SPECIALTY COMPANY, Waterloo, Iowa, which has been organized for the manufacture of the Lightning Dump Contractors' Wagons and other devices designed to save labor on the part of contractors, especially in the paving line. The company would be pleased to receive catalogues from manufacturers of Iron, Steel, Hardware and other supplies in its line.

FROM THE PLYMOUTH HARDWARE COMPANY, Plymouth, Mass., which has lately been incorporated, succeeding H. P. Bailey & Brother. The company's business covers Shelf and Heavy Hardware, Stoves, Agricultural Implements, Paints, Sporting Goods, Crockery and Glassware, Wooden Ware, Bicycles and Supplies, Plumbing, Heating, &c.

FROM SCOTT & Co., Justin, Tex., who have succeeded Scott & Gillespie in the general Hardware business.

FROM MORRISON & SPENCER, Conneaut, Ohio, who have lately opened up in business, carrying Shelf Hardware,

Stoves, Farming Implements, Paints and Oils and Sporting Goods.

FROM CREWS HARDWARE COMPANY, Watson, Mo., which has succeeded R. D. Horn at the old stand.

FROM PAUL M. WHALEY, who has opened a store at Oxford, Ohio, for the sale of general Hardware.

FROM PRITCHETT & BOVEN, Cynthiana, Ind., who are successors to McReynolds & Boyle in the Hardware, Implement, Paint, Sporting Goods and Furniture business.

FROM JOHNSTON-BEYER HARDWARE COMPANY, Plumville, Pa., which is just opening a branch store at this point, the main establishment being situated at Rural Valley, Armstrong County.

FROM FARMERS' HARDWARE COMPANY, Elberton, Ga. This business has lately passed into new hands, but will be continued under the same style as heretofore.

TRADE ITEMS.

THE STOCKHOLDERS of Landers, Frary & Clark, New Britain, Conn., Hardware manufacturers, have voted to increase the capital stock of the corporation from \$750,000 to \$1,000,000, the meeting being held September 7, when this favorable action was taken on the recommendation of the Board of Directors. The additional capital will be used to acquire such new lines of goods, to provide such facilities for making them in the way of new buildings and machinery and to make such other improvements in the property as will in the opinion of the directors increase the profits of the business.

THE TORRINGTON MFG. COMPANY, Torrington, Conn., manufacturer of Special Machinery and Metal Goods, has sold to the Turner & Seymour Mfg. Company, Torrington, its entire Brass Nail business. The sale does not include the Torrington Mfg. Company's miscellaneous department, comprising the cutting up of brass and other metals.

THE NATIONAL ENAMELING & STAMPING COMPANY is contemplating the erection of an addition to its plant at Berlin, Long Island, N. Y. This addition is intended to replace the company's Brooklyn factory, which has been sold, and as the old machinery will be transferred the purchase of new machinery will not be necessary. Substantial economies are expected to result from the proposed change and the centralization and combination in management that will be effected. The present plans, subject to modification, call for a five-story building about 70 x 200 or 250 feet.

E. B. RORICK, Hardware merchant of Morenci, Mich., died on the 26th ult., after a short illness. Mr. Rorick was born near Horseheads, N. Y., December 3, 1831. He began his career as a Hardware merchant in 1876, when he became associated with H. E. Green, composing the firm of H. E. Green & Co. of Morenci. With the exception of about seven years, in which he conducted a competitive store, Mr. Rorick had been closely connected with H. E. Green & Co. At the time of Mr. Green's death, in 1898, Mr. Rorick associated with him his son, Wm. B. Rorick, and J. M. Triggs, under whose management the store was conducted until May, 1904, when Mr. Triggs retired to give his full time to the management of the Chappell Furnace Company of Morenci. Mr. Rorick was one of the original incorporators of the Chappell Furnace Company and its first president. He was also president of the First National Bank of Morenci.

Boddeker & Lyons, dealers in general Hardware at Galveston, Texas, who were burned out lately, report that the rebuilding of their wareroom is progressing rapidly, and they expect to be in proper shape again in about two weeks.

W. A. Shofstall has succeeded Shofstall & Cowles, Novelty, Mo.

A Traveling Salesman on the Catalogue House Question.

A LETTER TO THE EDITOR.

FOR a year or more this burning question has occupied the center of the stage from the jobber's and retailer's point of view. Both have discussed it in letters to the Hardware journals and in the various meetings of the Hardware associations, but up to date I have failed to notice any communication from the man most vitally interested, the traveling salesman, "the man behind the gun." Therefore it is only meet and proper that some of the ideas that have come to me at random times be allowed expression through the Hardware forum, *The Iron Age*.

I note the progress made by the Catalogue House Committee and from the glow of their promises we can expect an early reformation of the offending ones. We

Catalogue House Committee's Work

can expect the catalogue houses to go out of business or to face right about, employ a corps of high-class traveling salesmen, and go into the jobbing business in the good old way. At the same time we are assured very solemnly by the committee that while the fight is on and the catalogue house is to be considered the common enemy and quite a number of manufacturers have gone on record not to sell them goods, that it is not their desire or intention to boycott the catalogue house. They simply wish the catalogue house to "regulate" their prices. All they want them to do is to give up the fundamental right to their existence, for that is the main excuse for their being in the world—the right to cut a price—the same inalienable right that every free born citizen is presumed to have. I am opposed first, last and all the time to anything in the nature of a boycott, for that is practically what the committee are asking the manufacturers

Boycott Not to be Tolerated

to do. It always proves a boomerang and returns to the ones who launch it with increased force. Aside from its moral aspect a boycott in this case would not be effective, as it is a matter of impossibility to prevent catalogue houses securing the goods they want, notwithstanding the efforts of the opposition. Admitting the possibility of the manufacturers refusing to supply their needs, which is not at all likely, what is to prevent them from establishing stores in the various towns near their headquarters and buying the goods from the numerous jobbers? Even if they were forced to carry the Hardware line for a period of years without any profit, they have so many diverse lines to retrench from that they could still do business and continue to declare a dividend. Whatever their difficulties I cannot help but feel that from a standpoint of justice and right they are

Justice and Right

clearly within their province, and according to their methods have as much right to do business as either the jobber or retailer. If they are to be criticised for their methods and for cutting a price, what is to be said of the jobber who encroaches on another jobber's territory, and in an effort to get business is guilty of certain inconsistencies that could not be considered fair competition. If we were to have a general house cleaning I am afraid we would have to confess that the catalogue house and the Sante Fé officials were not the only ones who were peculiar in their methods.

I do not mention this with any idea of affording relief to the situation, but simply for the sake of fair play and common honesty that we owe each other as business men. Let us practice a little consistency and do business in harmony with the trend of the times. Let us assist in the popular movement that is sweeping the country, throw off the yoke of protection, which is a graft in disguise, and come out in the open and fight this evil like men.

If I was so bold as to say that the retail dealer is largely responsible for the inception of the catalogue

house, I suppose some of our friends from Missouri would want to be shown. Did any of us ever meet a Hardware dealer who was actually ashamed when he made a profit of 500 per cent.? Or did any

Who Is Responsible?

of us as salesmen ever tell our customers that we thought they were making too much profit? I happened in a store of one of my customers recently while he was engaged in marking up a bill of Padlocks. I was invited to assist in the operation, which I accepted in good faith. The first Lock we struck cost \$2.25 a dozen, 19 cents each. "How much shall I mark it, Billy?" I said. He said, "Let's see the Lock," which was passed to him. After a careful examination he passed it back, and said: "Mark it 75 cents." The next cost, 10½ cents, which he instructed me to mark 40 cents. I then went on a

Bumper Profits

strike, stating to my friend that my conscience would not stand to be so outraged. I went to the next town, after giving my friend a "square deal" in a bill which he tried to buy at my cost! The first store I called on a lady entered and wanted a paper of Double Pointed Tacks. She asked the price, the dealer said 5 cents. She demurred, but paid the price, remarking that she "could buy them at the racket store two papers for 5 cents."

Every dealer knows what they cost, and, furthermore, knows that a handsome profit is made at two for a nickel. After she had gone out, I asked the dealer why he didn't sell them two for a nickel? "Well, because if I did the other Hardwareman in town would do it, and we would soon demoralize prices." How is that for logic?

The next place I called a carpenter came in and wanted some Drawer Pulls. The dealer wanted to charge him 10 cents each. The carpenter said he would not pay it, that he could send away to the catalogue house and get them. I broke in and asked him what he would be willing to pay; he said, 50 cents per dozen, so I sold him two dozen, and the dealer made about 50 per

Drawer Pulls and Nail Sets

cent. on the deal. The question of the catalogue house came up, and the carpenter said he wanted to buy a Nail Set, and went to every store in the town. All wanted 15 cents each. He finally had to send to the catalogue house and get four, which cost, with postage, 29 cents. I asked him if he would not be willing to pay 10 cents each, where he could get them as he wanted and make his own selection, and he said he would. Is there any reason why a dealer cannot sell a good Nail Set for 10 cents? If there is a reason I would like to hear it.

When a dealer is brought to bay, he says: "Oh, well, there are so many goods we have to sell without any profit that we have to charge a good price for the little things!" He seems to overlook the fact that it is the

Little Things the Trouble

little things that cause all the trouble, and that the big things usually take care of themselves. Admitting that they do sell so many goods without any profit, which, bless their dear, good souls! they do not, is that any reason for going to such wild extremes on other things? If they do, then they can expect to reap as they have sown, and harvest a crop of racket stores, department stores and catalogue houses.

Notwithstanding some of the beautiful theories expounded by a few of the smooth salesmen who can sell goods without the price being of prime importance, my experience of a lifetime justifies me in saying that the price is the chief desideratum, first, last and all the time. If this is not true, why all this talk?

In line with this idea, my belief is most emphatic that the Hardware dealer will have to come out in the open and make his own fight, and if he expects relief it will not be afforded him in that wonderful inscription: "The first duty of a jobber is to protect his customer."

Retailer Must Help Himself

He will have to work out his own salvation in the free and open field of competition and not lose sight of the idea expressed well and forcibly which I beg to quote: "Business is warfare. It's a hard, constant fight to a finish. The moment a contestant enters

the field of commerce he is challenged by a host of competitors. He must fight to live. He must conquer to succeed, and like the well-trained soldier, who delights in the clamor of battle, the enterprising business man is eager for the struggle of competition." I might add that if he cannot survive the onslaughts made on him from all sides, why, then the place for him is back to the simple life way down on the farm.

My contention is that the proper place for the people to buy Tacks is the Hardware store, and the proper one to sell them is the Hardware merchant. But he cannot expect to do so when he wants 5 cents a paper and his next door neighbor, the racket store, or department store, sells the same Tacks two papers for 5 cents. What is true of Tacks is true of various little items in the Hardware business, which a Hardware merchant can afford to sell just as cheap as any one of his competitors.

Hardwareman Can Sell as Cheap

Let them provide a special counter for all of the little items, and put a price on them that will move the goods. He will find his sales will increase very materially, and while his profit may be reduced somewhat the increased volume will compensate for the difference.

The wise merchant will not wait until he is forced to do this, but will seize time by the forelock and do it in advance, never forgetting that "an ounce of prevention is worth a pound of cure."

The next thing for a retail dealer to do, so as to act intelligently, is to provide himself with catalogues sent out by the catalogue house. He will find them a very valuable addition to his library, being the most comprehensive and complete catalogues issued by any one.

When a customer comes in and quotes a catalogue price bring out your book and reason the question out on a fair and equitable basis. Have the goods in stock, never forgetting that it is a tremendous advantage for a dealer to have the goods on hand, so that your customers

Have the Goods in Stock

can see them and make their own selection. In almost all cases they are willing to pay a little more; this little more and the freight or express charges constitute a profit—that is, if you buy your goods right. If you do not, why then it must be either your own fault or the fault of the jobber who prates so loudly about protecting you. Because you are called upon to meet this competition in some instances it does not follow that you have to do it with all of your customers.

It means that the small per cent. who are discriminating enough and who have the cash to pay for their purchases are the chief ones to be satisfied. When you have convinced that particular class that you can do as well for them as the catalogue house, the rest of the trade in that community will follow the lead of the bell wether of the flock, as very naturally they should, and after a season they will not study their catalogue, as it will have lost interest for them. The majority of dealers figure that they should make a certain per cent. of profit on all the goods they sell, and when a proposition is presented to them that shows a narrow margin of profit out of the ordinary, they simply throw up their hands and say they can't do it. Or they give a customer a talk about the inferiority of

Scared by a Narrow Margin

the other man's goods, which is the very best thing in the world for the other man.

Another matter of vast importance is to have good salesmen to wait on your trade. Pay them well, salary and commission basis, and do not forget that they are the shining star of your establishment. Every day I stand in stores and my blood boils with indignation to see the careless, slack manner of some clerks. Actually in a great many instances the customer is driven out of the store by the poor exhibition of salesmanship. This is equally true of a very great many proprietors, who are not any better salesmen than the men they employ. The next in importance is to have the goods in stock when the customer calls—not to-morrow, for to-morrow never

comes, but to-day. The dean of the Hardware trade covered that subject years ago very fluently and forcibly and made his word good by accumulating a jobber's stock that calls for the admiration of every Hardwareman throughout the universe. When I as salesman argue that point with my dear customers they think I am trying to instill a deadly poison into their anatomy, and some are narrow enough to believe that it is entirely a selfish motive that moves me. Others say they cannot afford it, which is only hedging. They can afford it, even if they have to buy a twelfth of a dozen, for there is no better advertising for any merchant than to have the people say: "You can get what you want at John Smith's store."

As to the question of advertising, it covers a wider field than the space of this article could hope to do justice to. Every live and up to date merchant realizes the importance of printers' ink. Those that do

Printers' Ink

not follow its mandate are soon in the class of has beens, and have no right to complain if the more progressive methods of their competitors force them to the rear.

Progressive merchants too should realize the importance of private brands. Select a reliable line that you can guarantee, push it, stick to it through thick and thin, regardless of any and all temporary setbacks that may come, and the end will be a niche in the Hardware Hall of Fame that your posterity will be proud of.

"THE MAN BEHIND THE GUN."

WESTERN MASSACHUSETTS HARDWARE CLUB.

THE WESTERN MASSACHUSETTS HARDWARE CLUB had a dinner and meeting at the Draper Hotel, Northampton, Tuesday evening, September 12. There was a representative attendance of members from the various cities and towns in the neighborhood of Springfield, and various matters relating to the trade were discussed. It was voted to hold the next meeting of the club at Westfield, Tuesday, November 14, and to have as the especial purpose of the meeting the getting together of the employees of the members. Each Hardware concern will take to the meeting from one to three clerks, and business matters pertaining to the general interests of the trade will be discussed. The club feels that it will benefit the entire trade for the salesmen, those who actually come in contact with the customer, to voice their opinions before the proprietors. There are many times when a salesman does not feel at liberty to suggest or protest as to some particular practice or custom in his place of employment, and it is thought by the club that by giving them all an opportunity to make suggestions the employer and employed will come in closer touch and thus benefit the business. Clarence Bacon, Springfield, is the president of the association, and O. H. Dickinson, Springfield, is the secretary.

HAMDEN MFG. COMPANY.

THE HAMDEN MFG. COMPANY, Hamden, Conn., will celebrate its seventy-fourth year in business by moving into its new factory recently purchased at Wallingford, Conn. One of the reasons which have made it necessary for the company to vacate its present quarters, which have been its home for so many years, is the large demand which has developed for the new Bit Brace put on the market about three months ago. The new plant will have double the floor space of the old. The company is also intending to open branch offices in Cuba and South Africa.

THE RICHMOND CEDAR WORKS, Richmond, Va., manufacturer of Wooden Ware, announces that it will put on the market a line of Ice Cream Freezers and will shortly build an additional plant for this purpose. It is stated that the Freezer will be made of the best material, the manufacturer producing all the parts but the castings, which are to be furnished by the Richmond Foundry & Mfg. Company.

SCREEN WIRE CLOTH VERSUS YELLOW FEVER.

ORDINANCES have recently been put into effect in a number of cities in the States of Louisiana and Mississippi which require the screening of tanks, cisterns, &c., containing water supply with 18-mesh Screen Wire Cloth. It is now quite generally believed that the transmission of yellow fever is due to a species of mosquito smaller than the ordinary marsh kind, and which breeds only in clean, still water. The purpose of the new ordinances is to prevent the breeding of these mosquitoes, and thereby the transmission of yellow fever germs.

With a view to reflecting the spirit of these ordinances we give below five of the eight sections comprising the ordinance adopted by the Council of the city of New Orleans, August 1, which prescribes "the manner in which water liable to breed mosquitoes shall be stored within the limits of the city of New Orleans":

Section 1. Be it ordained by the Council of the City of New Orleans, that no water liable to breed mosquitoes shall be stored within the limits of the city, except under the following conditions:

Section 2. Water kept in cisterns, tanks, barrels, buckets or other containers for a period longer than one week shall be protected from mosquitoes in the following manner: Cisterns shall be covered with oil by the property owner or agent thereof within 48 hours after the promulgation of this ordinance and provided with a cover of wood or metal; all openings in the top or within 6 feet of the top larger than 1-16 inch to be screened with netting of not less than 18 mesh or cheese cloth or other suitable material by the property owner or agent thereof within 48 hours after the promulgation of this ordinance; provided, that after the first day of October, 1905, all property owners shall be required to screen cisterns with wire netting of the proper size mesh as required by the Board of Health, in such a manner as to prevent the entrance of mosquitoes.

Section 3. Tanks or barrels or similar containers to be constructed in the manner provided for cisterns, or in some other manner satisfactory to the Board of Health.

Section 4. Buckets containing water for longer than one week (such as fire buckets in cotton presses) and other similar containers of stagnant water shall be covered in such a manner as to prevent the entrance of mosquitoes.

Section 5. Water in ponds, pools or basins, in public or private parks, places of resort or residences, or in depressions or excavations made for any purpose, shall be stocked with mosquito destroying fish, or covered with protective netting, or shall be drained off at least once every week, or shall be covered with coal oil in a manner satisfactory to the Board of Health by the owner or agent thereof within 48 hours after the promulgation of this ordinance.

This ordinance has now been effective in New Orleans for some time, and the opinion is expressed by well informed parties that the result in that city has been to confirm the opinion that the transmission and development of yellow fever is due to the mosquito, and also that where the patient is properly screened and isolated at the incipency of the disease there is no danger of the spread of the malady.

STEWART IRON WORKS COMPANY.

THE STEWART IRON WORKS COMPANY, Cincinnati, Ohio, manufacturer of Iron Fence, Lawn Furniture, &c., reports business for this year to date the largest by far in its history. Besides the addition to the works completed early in the year the company has recently finished a large addition to its main warehouse in Covington, making the building 125 x 223 feet, one and two stories high, it being the intention to carry double as much stock of Steel Bars, Malleable Castings, &c., as heretofore to meet the increased demand for Iron Fence, Lawn Vases, Settees, &c., and to make prompt shipments. This company's plant now contains nearly 100,000 square feet of floor space under roof, with ample adjoining ground for future additions when needed. The plant is operated entirely by electricity and is said to be one of the best lighted, best equipped and most conveniently arranged factories in the country. The capacity of the plant is more than 1,000,000 lineal feet of Iron Fence per annum, in addition to the department for the manufacture of Lawn Furniture, &c. The Messrs. Stewart, who founded this business more than 20 years ago, are practical mechanics and business men and own many valuable patents used in connection with the manufacture of its goods. The officers of the company are: R. C. Stewart, Jr., president and treasurer; W. A. Stewart, vice-president, and Robert S. Stewart, secretary.

GEORGE WOSTENHOLM & SON'S NEW HEADQUARTERS.

GEORGE WOSTENHOLM & SON, LIMITED, Sheffield, England, have just moved their New York headquarters from 96 Reade street, where they have been since 1898, to 105 Chambers street. This change has been brought about by a steady increase in business, necessitating larger capacity for storing stock, and will also afford a better showroom and improved facilities for serving the trade. Wostenholm Cutlery has been sold in this country for over 70 years, and for a long period was represented by the late Asline Ward. After his retirement Edward Becket became the agent, but in 1898 the manufacturers established a branch office under their own name, with George Quirk as manager, which has since been successfully operated under his direction.

MISCELLANEOUS NOTES.

Boys' Wagons and Coasters.

White Wagon Works, Sheboygan Falls, Wis., which makes an attractive line of boys' wagons and coasters, is now equipping all sizes of its wagons with thimble skeins. Formerly only the larger sizes were so provided.

E. T. Fraim's New Padlocks.

Keystone Lock Works, E. T. Fraim proprietor, Lancaster, Pa., New York office 37 Warren street, has added a number of new goods to its line. These include Rural Free Delivery padlocks, a line of armored steel shell padlocks with malleable steel shackle, a new night latch and eight assortments of padlocks on easel cards; also dog collar padlock assortment on cards. These goods in connection with Mr. Fraim's former line are shown in a catalogue recently issued.

Burling Irons.

Herbert Story, 23 Duane street, New York, handling full lines of tools for woolen and silk mills, masons', plasterers', sidewalk and plumbers' tools, &c., has begun the manufacture of burling irons, a kind of steel tweezers used by woolen weavers to pick seeds and various foreign substances from the face of the goods during manufacture. This and similar tools have heretofore been imported from England. The pattern now being made is $3\frac{3}{4}$ inches long, greatest width $\frac{3}{4}$ inch, $1\frac{1}{4}$ inches from the two points and polished both sides. The parts are welded at the opposite end from the points, spring fashion, so that pressure closes the points about $3\text{--}32$ inch on any alien matter which it is desirable to remove from the cloth. A full line of burling irons in the various patterns and sizes will be manufactured.

Improved Wringer Parts.

The American Wringer Company, 99 Chambers street, New York, has recently added several improvements to its numerous lines of clothes wringers. One is a new pattern top pressure screw, flat and vertical, $2\frac{3}{4}$ inches wide by $1\frac{1}{2}$ inches high, to afford an adequate purchase instead of the horizontal valve wheel shape to which objection has sometimes been made. An important betterment is the new style combination button clamp for securely fastening wringer to tub, which is said to work equally well on straight or round tubs. The clamping surface is now much larger, being $1\frac{1}{2}$ inches in diameter, while the upper part of the same piece is made stronger and grips more firmly the ribbed swinging arm. Still another detail is a self oiling metal bearing for both ends of the bottom roll. This consists of a piece of grooved metal for the ball bearing to rest on instead of the wood end.

Hustler Ash Sifter No. 2.

The Hill Dryer Company, Worcester, Mass., best known as manufacturer of the Hill dryer, has made radical improvements on its Hustler ash sifter, which increases its efficiency as a useful and economical acces-

sory of the household. The top of the hopper has been made wider, and instead of square corners of the lower part curved lines have been made, and the bottom of the hopper projects into the cylinder, by which the sifting is accomplished as it revolves. Another important improvement is in the increased size of the meshed wire cylinder,

blades being placed in the center of handle and riveted in the middle. In this style it will be observed that the blades, while short, are sufficiently strong to give substantial service. Fig. 2 represents a knife constructed on the same principles, but artistically etched in gold and silver in both flower and bird ornamentation against



Fig. 1.—Thin Gun Metal Handle Vest Pocket Knife.

which is now 9 inches in diameter, as compared with 7½ inches in the old style.

A New Cheap Mower.

Philadelphia Lawn Mower Company, 3101 to 3109 Chestnut street, Philadelphia, Pa., has added a new



Fig. 2.—Similar Knife with Gold and Silver Etching.

cheap lawn mower to its list, which is intended to meet competition as to prices and quality. This mower has an 8-inch wheel and three blades, with a number of patented improvements.

Painters' Safety Hook.

Ira B. Smith, Bristol, Conn., is placing on the market the safety hook shown herewith. It is designed for the use of painters, and is made of 3-32-inch flattened steel japanned wire ¾ inch wide and 5 inches long, the wire being corrugated so as to stiffen the hook. A tempered steel spring, riveted to the hook, prevents the ball of



Painters' Safety Hook.

the tin pail or bucket slipping off after it is attached, and the larger end of the hook can be hung over the round of a ladder.

Thin Pocket Knives.

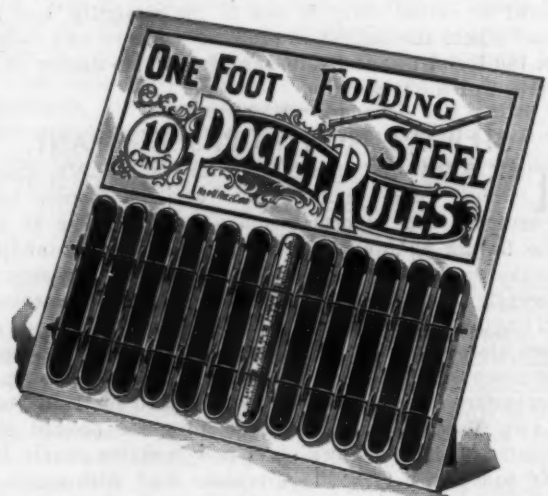
Among a number of new styles and sizes of fine cutlery of diverse kinds just received by Graef & Schmidt, 107 Chambers street, New York, sole agents in the United States and Canada for J. A. Henckels, Solingen, Germany, are the Twins brand pocket knives, here reproduced exact size. The novel and unique feature of these and the thirteen other kindred patterns in the assortment is the extreme thinness and small space required for even the four-blade knives. Fig. 1 reproduces a knife for gentlemen but ¼ inch thick, with plain gun metal finish handle, the double bifurcated one-piece spring with forklike ends to operate the four

a gun metal finish background, and, like the other knife, it is only ¼ inch thick, there being both three and four blade styles with the etching alike on each side. In the four-blade pattern another small blade is added. Other styles are etched in gold, silver and royal blue, or ruby, some on one side only, others on both sides. The handles are well formed ovals from 2¼ to 3¼ inches long, according to the purpose for which they are designed. One pattern, somewhat stouter, has a corkscrew, the handle in this style being only 3-16 inch thick, while others, for ladies, have delicate blades in harmony with the shape and style of knife. The entire group is of the finest work-

manship, both in grade and finish, and handsome in appearance.

Folding Steel Pocket Rule Assortment.

The Lufkin Rule Company, Saginaw, Mich., and 280 Broadway, New York, is marketing a 1-foot flexible folding steel pocket rule, as here shown, which, while not entirely new, has some novel features. One of interest to the merchant is that as now supplied on a display card, 9½ x 11½ inches, with nicked easel support, the rules can be profitably retailed for 10 cents each instead of 25 cents apiece as heretofore. This rule, ¾ inch wide, has two brass riveted joints, each of the three 4-inch sections,



Folding Steel Pocket Rule Display Card.

being etched on one side in inches to sixteenths and inclosed in a metallic edge leather case in assorted colors. The card lettering is in blue, the rules, one of which near the center is outside of case, thus making an attractive display with selling price to catch a possible purchaser's attention. The rules are held in place by two lines of elastic, and to insure receipt of card in perfect condition each one is completely inclosed in a stout double folded cardboard container and tied.

Perfect Ice Creeper.

The ice creeper shown herewith is made of cold rolled steel, galvanized, and the spikes are of hardened steel. It



Perfect Ice Creeper.

is fastened to the shoe with an automatic adjusting web and is easily and quickly put on or taken off. The device is offered by the Blair Husking Glove Company, Bucyrus, Ohio.

H. S. & Co.'s Tourist Autokit.

The tourist autokit illustrated herewith is offered by Hammacher, Schlemmer & Co., Fourth avenue and



H. S. & Co.'s Tourist Autokit.

Thirteenth street, New York. The kit is made up of 38 articles contained in a heavy canvas roll, leather edged. Every tool is especially selected with reference to its

quality and adaptability for use in an automobile kit, while it has been the firm's design to have the collection embody every possible permanent and emergency requirement that could be included in a kit of this size.

Meriden Cutlery Company's Display Boxes.

Meriden Cutlery Company, Meriden, Conn., New York office 10 Warren street, is manufacturing boxes like the one shown in the accompanying cut for the display of its cutlery in stores. The boxes are made to hold one-



Meriden Cutlery Company's Display Boxes.

sixth gross each of any six patterns, medium size, made by the company, and are provided with clasps to sample each pattern. The manufacturer remarks that the use of the boxes will increase the merchant's sales.

The partnership of Alderman & Carlisle, Hardware merchants, Springfield and North Adams, Mass., has been dissolved, under date of August 28. Oliver C. Alderman will retain the Springfield store and Fred. E. Carlisle the North Adams store.

PAINTS, OILS AND COLORS**Animal, Fish and Vegetable Oils—**

Linseed, City, raw.....	54	@55
Linseed, City, boiled.....	56	@57
Linseed, State and West'n, raw.....	52	@53
Linseed, raw Calcutta seed.....	62	@63
Lard, Extra Prime, Winter.....	61	@62
Lard, Extra No. 1.....	47	@48
Lard, No. 1.....	35	@36
Cotton-seed, Crude, f.o.b. mills.....	20	@21
Cotton-seed, Summer Yellow.....	26	@27
Prime.....	26	@26 1/2
Cotton-seed, Summer Yellow, off grades.....	26	@26 1/2
Sperm, Crude.....	55	@56
Sperm, Natural Spring.....	58	@59
Sperm, Bleached Spring.....	60	@61
Sperm, Natural Winter.....	60	@61
Sperm, Bleached Winter.....	63	@64
Tallow, Prime.....	51	@52
Whale, Crude.....	42	@43
Whale, Natural Winter.....	42	@43
Whale, Bleached Winter.....	44	@45
Menhaden, Brown, Strained.....	28	@29
Menhaden, Light, Strained.....	29	@30
Menhaden, Bleached, Winter.....	31	@32
Menhaden, Ex-Bld. Winter.....	32	@33
Menhaden, Southern.....	16	@16 1/2
Cocanut, Ceylon.....	16	@16 1/2
Cocanut, Cochiti.....	16	@16 1/2
Cod, Domestic, Prime.....	34	@35
Cod, Newfoundland.....	39	@40
Red, Elaine.....	35	@36
Red, Saponified.....	35	@36
Olive, Italian, bbls.....	57	@58
Neatsfoot, prime.....	49	@50
Palm, Logos.....	10	@11

Mineral Oils—

Black, 29 gravity, 25 cold test.....	10 1/2	@11 1/2
Black, 29 gravity, 15 cold test.....	11 1/2	@12 1/2
Black, Summer.....	10 1/2	@11 1/2
Cylinder, light filtered.....	18	@19
Cylinder, dark filtered.....	16	@17
Paraffine, 303-307 gravity.....	12 1/2	@13
Paraffine, 303 gravity.....	11 1/2	@12
Paraffine, 303 gravity.....	9 1/2	@10 1/2
Paraffine, Red.....	11 1/2	@12 1/2
In small lots 1/2 advance		

Miscellaneous—

Barytes, White, Foreign.....	17.50	@18.00
Barytes, Amer. floated.....	18.00	@19.00
Barytes, Crude, No. 1.....	19.00	@20.00
Chalk, in bulk.....	3.00	@3.25
Chalk, in bbls.....	100 lb	@35
China Clay, English.....	11.00	@17.00
Cobalt, Oxide.....	100 lb	2.50 @ 2.60
Whiting, Common.....	100 lb	.43 @ .48
Whiting, Gilders.....	100 lb	.50 @ .55
Whiting, Ex. Gilders.....	100 lb	.55 @ .60
Putty, Commercial—	100 lb	
In bladders.....	1.70	@1.75
In bbls, or tubes.....	1.10	@1.15
In 1 lb to 5 lb cans.....	2.60	@2.90
In 12 1/2 to 50 lb cans.....	1.40	@1.55
Spirits Turpentine—	gal.	
In Oil bbls.....	64 1/2	@65
In machine bbls.....	65	@65 1/2
Glue—	lb	
Cabinet.....	11	@15
Common Bone.....	7	@9
Extra White.....	18	@24
Foot Stock, White.....	11	@14
German Hide.....	12	@18
French.....	10	@16
Irish.....	13	@19
Low Grade.....	9	@12
Medium White.....	14	@21
Gum Shellac—	lb	
Bleached Commercial.....	37	@38
Bone Dried.....	47	@48
Button.....	36	@45
Diamond I.....	45	@47
Fine Orange.....	45	@47
A. C. Garnet.....	39	@40
D. C.....	35	@36
Octagon B.....	42	@43
T. N.....	41	@42
V. S. O.....	58	@60
Colors in Oil—	lb	
Black, Lampblack.....	12	@14
Blue, Chinese.....	36	@46
Blue, Prussian.....	32	@36

Blue, Ultramarine.....	13	@16
Brown, Vandyke.....	11	@14
Green, Chrome.....	10	@15
Green, Paris.....	11	@14
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14
White Lead, Zinc, &c.—	lb	
Lead, English white, in Oil.....	9 1/2	@9 1/2
Lead, American white, in Oil:		
Lots of 500 lb or over.....	6 1/2	@6 1/2
Lots less than 500 lb.....	7	@7
In Barrels.....	6	@6
Lead, White, in oil, 25 lb tin		
pails, add to keg price.....	1 1/2	@1 1/2
Lead, White, in oil, 12 1/2 lb tin		
pails, add to keg price.....	1	@1
Lead, White, in oil, 1 to 5 lb		
ass'ted tins, add to keg price.....	1 1/2	@1 1/2
Lead, American, Terms: For lots 12 tons and over 1/2¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.		
Lead, White, Dry in bbls.....	6	@6
Zinc, American, dry.....	4 1/2	@4 1/2
Zinc, French:		
Paris, Red Seal dry.....	5 1/2	@5 1/2
Antwerp, Red Seal, dry.....	7 1/2	@7 1/2
Antwerp, Green Seal, dry.....	9 1/2	@9 1/2
Zinc, V. M. French, in Poppy Oil:		
Green Seal:		
Lots of 1 ton and over.....	12	@12 1/2
Lots of less than 1 ton.....	12 1/2	@12 1/2
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	10 1/2	@11 1/2
Lots of less than 1 ton.....	11	@11 1/2
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.		
Dry Colors—	lb	
Black, Carbon.....	5	@10
Black, Drop, Amer.....	4	@6
Black, Drop.....	5	@15

Black, Ivory.....	16	@20
Lamp, Com.....	4 1/2	@6
Blue, Celestial.....	4	@6
Blue, Chinese.....	4	@32
Blue, Prussian.....	27	@30
Blue, Ultramarine.....	4 1/2	@15
Brown, Spanish.....	1 1/2	@1
Carmine, No. 40.....	3.50	@3.60
Green, Chrome, ordinary.....	3 1/2	@6
Green, Chrome, pure.....	17	@25
Lead, Red, bbls, 1/2 bbls and kegs:		
Lots 500 lb or over.....	6 1/2	@6 1/2
Lots less than 500 lb.....	7	@7
Litharge, American, bbls.....	5	@6 1/2
Ocher, American.....	10	@16.00
Ocher, American Golden.....	2 1/2	@3 1/2
Ocher, French.....	1 1/2	@2 1/2
Ocher, Foreign Golden.....	3	@4
Orange Mineral, English.....	3	@10
Orange Mineral, French.....	10 1/2	@12 1/2
Orange Mineral, German.....	3	@10
Orange Mineral, American.....	3 1/2	@4 1/2
Red, Indian, English.....	1 1/2	@3 1/2
Red, Indian, American.....	3	@3 1/2
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@10
Red, Venetian, Amer.....	100 lb	\$0.50 @ 1.25
Red, Venetian, English.....	100 lb	\$1.15 @ 1.75
Sienna, Italian, Burnt and Powdered.....	3	@9 1/2
Sienna, Ital., Raw, Powd.....	3	@6 1/2
Sienna, American, Raw.....	1 1/2	@2
Sienna, American, Burnt and Powdered.....	1 1/2	@2
Talc, French.....	10	@15.00 @ 20.00
Terra Alba, French.....	100 lb	\$0.25 @ 0.50
Terra Alba, English.....	100 lb	\$0.90 @ 1.00
Terra Alba, American.....	100 lb	\$0.00 @ 0.70
No. 1.....		
No. 2.....		
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No. 4.....		
No. 5.....		
No. 6.....		
No. 7.....		
No. 8.....		
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No. 93.....		
No. 94.....		
No. 95.....		
No. 96.....		
No. 97.....		
No. 98.....		
No. 99.....		
No. 100.....		

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$ @ 33 $\frac{1}{2}$ & 10% signifies

that the price of the goods in question ranges from 33 $\frac{1}{2}$ per cent. discount to 33 $\frac{1}{2}$ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33 $\frac{1}{2}$ %
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....25%
Taplin's Perfection.....30%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils..... $\frac{1}{2}$ lb 6%
Hay-Budden, Wrought.....80%
Horsehoe brand, Wrought.....80%
Trenton..... $\frac{1}{2}$ lb 6%
Imported..... $\frac{1}{2}$ lb 10%

Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15-10%

Apple Parers—See Parers.

Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.....33 $\frac{1}{2}$ %

Augers and Bits—

Com. Double Spur.....75@75-5%
Jennings' Patn., reg. finish.....50-10@60

Black Lip or Blued.....60-10%

Boring Mach. Augers.....70-10%

Car Bits, 12-in. twist.....50-10%

Ford's Auger and Car Bits.....40-5%

Forstner Pat. Auger Bits.....25%

C. E. Jennings & Co.:
No. 10. 10 ft. lip. B. Jennings' list.....25%

No. 30. B. Jennings' list.....40-7%

Russell Jennings.....25-10@25%

L'Hommedieu Car Bits.....15%

Mayhew's Countersink Bits.....45%

Millers Falls.....50-5@7%

Ohio Tool Co.'s Bailey Auger.....40-10%

Pugh's Black.....40-10%

Pugh's Jennings' Pattern.....35%

Snell's Auger Bits.....60%

Snell's Bell Hangers' Bits.....60%

Snell's Car Bits, 12-in. twist.....60-10%

Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, \$18; large, \$26.....50-10%

Clark's Pattern, No. 1, $\frac{1}{2}$ doz. \$26.....25-10%

No. 2, \$18.....60-5%

Ford's Clark's Pattern.....60-5%

C. E. Jennings & Co., Steer's Pat. 25.....60%

Swan's.....60%

Gimlet Bits—

Common Dble. Cut.....\$3.00@3.25

German Pattern, Nos. 1 to 10,
\$4.60; 11 to 15, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00

Ames.....25-10%

Universal.....20%

Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....33 $\frac{1}{2}$ @5%

C. E. Jennings & Co.:
L'Hommedieu's.....15%

Watrous.....35-5%

Ohio Tool Co.'s.....60%

Snell's.....60%

Awl Hafts—See Hafts, Awl.

Awls—

Brad Awls:
Handled.....gro. \$2.75@3.00

Unhlded, Shldered.....gro. \$3.00@3.25

Unhlded, Patent.....gro. \$3.00@3.25

Peg Awls:
Unhlded, Patent.....gro. \$1.00@1.25

Unhlded, Shldered.....gro. \$1.00@1.25

Scratch Awls:
Handled, Com.....gro. \$3.50@4.00

Handled, Socket.....gro. \$1.15@1.20

Hurwood.....40%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights:
First Quality.....\$6.75

Second Quality.....\$6.25

Double Bit, base weights:
First Quality.....\$8.75

Second Quality.....\$8.25

Axle Grease—

See Grease, Axle

Axles—

Iron or Steel
Concord, Loose Collar.....\$4.00@4.50

Concord, Solid Collar.....\$4.00@4.50

No. 1 Common, Loose.....33 $\frac{1}{2}$ @33 $\frac{1}{2}$

No. 1 $\frac{1}{2}$ Com., New Style.....40-10%

No. 2 Solid Collar.....40-10%

Half Patent:
Nos. 7, 8, 11 and 12.....75@75-5%

Nos. 13 to 14.....70-10@75-5%

Nos. 15 to 18.....75-10@75-10-5%

Nos. 19 to 22.....75-10@75-10-5%

Boxes, Axle—

Common and Concord, not turned
lb. 1 $\frac{1}{2}$ @6

Common and Concord, turned,
lb. 5 $\frac{1}{2}$ @6

Half Patent.....lb. 8 $\frac{1}{2}$ @9

Bait—

Hendryx:
A Bait.....20%

B Bait.....25%

Competitor Bait.....20-5%

Balances—

Caldwell new list.....50%

Pullman.....50-10@60

Spring—

Spring Balances.....50-10@60%

Chatillon's:
Light Spg. Balances.....40-10%

Straight Balances.....40%

Circular Balances.....50%

Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—

Steel Crowbars, 10 to 40 lb.....
per lb., 2 $\frac{1}{2}$ @3

Towel—

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$ gro. \$8.50

Beams, Scale—

Scale Beams.....40-10@50%

Chatillon's No. 1.....30%

Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$0.85;

Tinned.....\$1.00

No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.10;

Tinned.....\$1.20

No. 10 Wire Galvanized.....\$1.75

Western W. G. Co.:
No. 1 Electric..... $\frac{1}{2}$ gro. \$7.80

No. 2 Buffalo..... $\frac{1}{2}$ gro. \$9.00

No. 3 Perfection Dust..... $\frac{1}{2}$ gro. \$6.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned..... $\frac{1}{2}$ doz. \$1.20

Holt, No. 1, Tinned..... $\frac{1}{2}$ doz. \$1.50

Holt, No. B, Japanned..... $\frac{1}{2}$ doz. \$2.00

Holt, No. 2, Tinned..... $\frac{1}{2}$ doz. \$2.25

Lyon, No. 2, Japanned..... $\frac{1}{2}$ doz. \$1.25

Lyon, No. 3, Japanned..... $\frac{1}{2}$ doz. \$1.50

Taplin Mfg. Co.:
No. 60 Improved Dover.....\$6.00

No. 75 Improved Dover.....\$6.50

No. 100 Improved Dover.....\$7.00

No. 102 Improved Dover, Tin'd.....\$8.50

No. 150 Improved Dover, Hotel.....\$15.00

No. 182 Imp'd Dover, Hotel, T'd.....\$17.00

No. 200 Imp'd Dover Tumbler.....\$8.50

No. 202 Imp'd Dover Tumbler, T'd.....\$9.50

No. 300 Imp'd Dover Mammoth.....\$30.00

Western W. G. Co., Buffalo.....\$7.00

Wonder (S. S. & Co.), $\frac{1}{2}$ gro. net, \$6.00

Bellows—

Blacksmith, Standard List.....
60-10@70-10%

Hand—

Inch.. 6 7 8 9 10
Doz.....\$4.75 5.70 6.65 7.60 8.85

Molders—

Inch.. 9 10 11 12 14
Doz.....\$8.00 9.00 10.50 12.50 14.50

Bells—Cow—

Ordinary goods.....75-5@75-10-5%

High grade.....70-10@70-10-5%

Jersey.....75-10%

Texas Star.....50%

Door—

Abbe's Gong.....45%

Burton Gong.....50%

Horne, R. & E. Mfg. Co.'s.....55-10%

Lever and Pull, Sargent's.....60-10@10%

Trip Gong.....50-10@50-10-5%

Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.....
60-5@60-10%

White Metal.....60%

Nickel Plated.....50-10@50-10-5%

Scales.....60-10@70-10%

Come's Globe Hand Bells.....33 $\frac{1}{2}$ @35%

Silver Chime.....33 $\frac{1}{2}$ @35%

Miscellaneous—

Farm Bells.....lb. 2 $\frac{1}{2}$ @

Steel Alloy Church and School.....
50-10-5@60-5%

American Tube & Stamping Co.
Gongs.....75%

Table Call Bells.....50-5@10%

Belting—Leather—

Extra Heavy, Short Lap.....60-5%

Regular Short Lap.....60-10-5%

Standard.....70%

Light Standard.....70-5%

Cut Leather Lacing.....60%

Leather Lacing Sides, per sq. ft. 22

Rubber—

Agricultural (Low Grade).....
75@75-5%

Common Standard.....70-70-10%

Standard.....60-5@60-10%

Extra.....60-10-5%

High Grade.....50-5@50-10%

Bench Stops—

See Stops, Bench

Benders and Upsetters.

Tire—

Detroit Perfected Tire Bender.....40%

Green River Tire Benders and Upsetters.....20%

Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25;
No. 3, \$10.50; No. 4, \$16.25; No. 5,
\$20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain.....50%

Parts.....50%

Spokes.....50%

Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills,
&c.—See Augers and Bits.

Blocks—Tackle—

Common Wooden.....70-10@75%

Harts St. Tackle Blocks.....50-5@5%

Hollow Steel Blocks, with Ford's
Patent Sheaves.....50-10%

Lane's Patent Automatic Lock and
Junior.....30%

Stowell's Novelty, Mal. Iron.....50-10%

Stowell's Self Loading.....60%

See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....30-10@40-10%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....38 $\frac{1}{2}$ %

Boils—

Carriage, Machine, &c.—
Common Carriage (cut thread):
% 6 and Smaller.....75-10%

Larger and Longer.....
65-10@21-10%

Phila. Eagle \$3.00 list May 24, '99
80%

Bolt Ends, list Feb. 14, '95.....
70-21-10%

Machine, % 4 and smaller
75-21-10%

Machine, larger and longer.....
70-21-10%

Door and Shutter—

Cast Iron Barrel, Japanned,
Round Brass Knob:
Inch..... 3 4 5 6 8
Per doz. \$0.30 .35 .45 .56 .75

Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz.....\$1.15 1.40 2.00

Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz.....\$0.95 1.25 1.55

Cast Iron Shutter, Japanned,
Brass Knobs:
Inch..... 6 8 10
Per doz.....\$0.80 .90 1.20

Wrt Barrel Jap'd.....80-10@10%

Hendryx Bronze: 700, 800 series. 40&10%
Hendryx Enamelled. 40&10%
Calipers—See Compasses—
Calks, Toe and Heel—
Blunt, 1 prong. per lb. 14¢
Sharp, 1 prong. per lb. 14¢
Gautier, Blunt. 4¢
Gautier, Sharp. 4¢
Perkins', Blunt Toe. 3¢
Perkins', Sharp Toe. 3¢

Can Openers—
See Openers, Can.

Cans, Milk—
5 8 10 gal.
Illinois Pattern. \$1.35 1.85 2.05 each.
New York Pattern. 1.50 2.20 2.45 each.
Baltimore Pattern. 1.50 2.20 2.45 each.
Dubuque 1.35 1.60 1.75 each.

Cans, Oil—
Buffalo Family Oil Cans:
3 5 10 gal.
\$18.00 60.00 120.00 gro., net.

Caps, Percussion—
Eley's E. B. 5¢
G. D. per M 34¢
F. L. per M 40¢
G. E. per M 40¢
Musket per M 62¢

Primers—
Berdan Primers, 2¢ per M. 20%
B. L. Caps (Starrevant Shells). 20%
2¢ per M. 20%
All other primers per M. \$1.52 @ 1.60

Cartridges—
Blank Cartridges:
32 O. F., \$5.50. 10¢
32 C. F., \$7.00. 10¢
22 cal. Rim, \$1.50. 10¢
22 cal. Rim, \$2.75. 10¢
B. B. Caps, Con. Ball, Snyd. \$1.90
B. B. Caps, Round Ball. \$1.49
Central Fire. 25¢
Target and Sporting Rifle. 15¢
Primed Shells and Bullets. 15¢
Rim Fire, Sporting. 50¢
Rim Fire, Military. 15¢

Castors—
Bed 70¢
Plate 60¢
Philadelphia 75¢
Acme, Ball Bearing. 35¢
Boss 70¢
Boss Anti-Friction. 70¢
Gem (Roller Bearing). 30¢
Martin's Patent (Phoenix). 45¢
Standard Ball Bearing. 35¢
Tucker's Patent low list. 35¢
Yale (Double Wheel) low list. 50¢

Cattle Leaders—
See Leaders, Cattle.
Chain, Coil—
American Coil, Straight Link:
3-16 1/4 5-16 3/4 7-16 1/2 9-16
\$7.95 5.40 4.50 3.85 3.70 3.60 3.55
1/2 3/4 1 1 1/4 to 1 1/2 inch.
\$3.50 3.40 3.35 3.45 per 100 lb.
German Coil. 60¢
Halter—
Halter Chains. 60¢
German Pattern Halter Chains.
list July 21, '97. 60¢
Covert Mfg. Co. 35¢
Halter 35¢
Covert's Saddlery Works. 70¢
Halter 70¢

Cow Ties—
See Halters and Ties.
Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6 1/2-6-3, Strght, with ring. \$23.50
6 1/2-6-3, Strght, with ring. \$24.50
6 1/2-8-3, Strght, with ring. \$28.00
6 1/2-10-2, Strght, with ring. \$32.00
NOTE.—Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than
Straight Link.
Trace, Wagon and Fancy
Chains 60¢
Miscellaneous—
Jack Chain, list July 10, '93:
Iron 60¢
Brass 60¢
Safety Chain. 75¢
Gal. Pump Chain. 10¢
Covert Mfg. Co.:
Brest 35¢
Heel 35¢
Rein 35¢
Stallion 35¢
Covert Sad. Works:
Hold Back. 70¢
Rein 70¢
Oneda Community:
Am. Dog Leads and Kennel Chains.
Chains 45¢
Wire Goods Co.:
Dog Chain. 70¢
Universal Dbl.-Jointed Chain. 50¢

Chain and Ribbon, Sash—
Oneda Community:
Copper Chain. 60¢
Steel Chain. 60¢
Pullman:
Bronze Chain. 60¢
Steel Chain. 60¢
Sash Chain Attachments, per set. 3¢
Aluminum Sash Ribbon, per 100
ft. \$1.25 @ \$3.00
Sash Ribbon Attachments, per set. 3¢

Chalk—(From Jobbers.)
Carpenters' Blue. 38¢
Carpenters' Red. 35¢
Carpenters' White. 25¢
See also Crayons.

Checks, Door—
Bardley's 45¢
Eclipse 60¢
Pullman, per gro. \$54.00
Russwin 40¢

Chests, Tool—
American Tool Chest Co.:
Boy's Chests, with Tools. 50¢
Youths' Chests, with Tools. 40¢
Gentlemen's Chests, with Tools. 30¢
Furniture, Carpenters', etc., Chests.
with Tools. 20¢
Machinists' and Pipe Fitters'
Chests, Empty. 50¢
Tool Cabinets. 50¢
C. E. Jennings & Co.'s Machinists'
Tool Chests. 35¢
Chisels—
Socket Framing and Firmer
Standard List. 75¢
Buck Bros. 30¢
Charles Buck 30¢
C. E. Jennings & Co. Socket Firmer
No. 10. 60¢
C. E. Jennings & Co. Socket Fram-
ing No. 15. 70¢
Ohio Tool Co.'s. 75¢
Swan's 75¢
L. & J. White. 30¢

Tanged
Tanged Firmers. 33 1/2-33 1/2 33 1/2-33 1/2
Buck Bros. 30¢
Charles Buck 30¢
C. E. Jennings & Co. Nos. 191, 181. 25¢
L. & J. White, Tanged. 25¢
Cold
Cold Chisels, good quality. 13¢
Cold Chisels, fair quality. 11¢
Cold Chisels, ordinary. 9¢
Chucks—
Beach Pat., each \$3.00. 35¢
Empire 25¢
Blacksmiths' 25¢
Jacobs' Drill Chucks. 25¢
Pratt's Positive Drive. 25¢
Skinner Patent Chucks. 50¢
Independent Lathe Chucks. 50¢
Universal 50¢
Combination 50¢
Drill Chucks, New Model. 30¢
Drill Chucks, Standard. 45¢
Drill Chuck, Skinner Pat., all sizes. 35¢
Drill Chucks, Positive Drive. 25¢
Planer Chucks. 25¢
Face Plate Jaws. 40¢
Standard Tool Co.:
Improved Drill Chuck. 45¢
Union Mfg. Co.:
Czar Drill. 35¢
Combination Geared Scroll. 40¢
Geared Scroll. 40¢
Independent 50¢
Independent Steel. 40¢
Union Drill. 50¢
Universal 50¢
Independent Iron F. Plate Jaws. 40¢
Independent Steel F. Plate Jaws. 40¢
Westcott Patent Chucks:
Lathe Chucks. 50¢
Little Giant Auxiliary Drill. 50¢
Little Giant Double Grip Drill. 50¢
Little Giant Drill, Improved. 50¢
Oneda Drill. 50¢
Scroll Combination Lathe. 50¢

Clamps
Adjustable, Hammers. 20¢
Cabinet, Sargent's. 50¢
Carriage Makers', P. S. & W. 40¢
Carriage Makers', Sargent's. 60¢
Besly, Parallel. 10¢
Lineman's, Utica Drop Forge & Tool
Co. 40¢
Saw Clamps, see Vises, Saw Filers'.
Wood Workers, Hammers. 10¢
Cleaners, Drain—
Iwan's Champion, Adjustable. 55¢
Iwan's Champion, Stationary. 55¢
Sidewalk—
Star Socket, All Steel. \$4.05 net
Star Shank, All Steel. \$3.24 net
W. & C. Shank, All Steel. \$4.05 net
7 1/2 in. \$3.00; 8 in. \$3.25.

Cleavers, Butchers—
Foster Bros. 30¢
New Haven Edge Tool Co.'s. 45¢
Fayette R. Plumb. 35¢
L. & J. White. 30¢
Clippers—
Chicago Flexible Shaft Company:
'98 Chicago Horse. \$8.75
1902 Chicago Horse. \$10.75
20th Century Horse, each. \$5.00. 30¢
Lightning Belt. \$15.00
Chicago Belt. \$20.00
Stewart's Patent Sheep. \$12.75

Clips, Axle—
Eagle, 5-16 and 3/4 in. 75¢
Norway, 5-16 and 3/4 in. 60¢
Cloth and Netting, Wire
—See Wire, &c.

Cocks, Brass—
Hardware list:
Compression, Plain Bbbs.
Globe, Kerosene, Racking,
&c., Cocks. 70¢
Coffee Mills—
See Mills, Coffee.

Collars, Dog—
Nickel Chain, Walter B. Stevens &
Son's list. 40¢
Leather, Walter B. Stevens & Son's
list. 40¢

Combs, Curry—
Metal Stamping Co. 40¢
Mane and Tail—
Covert's Saddlery Works. 60¢
Compasses, Dividers, &c.
Ordinary Goods. 75¢
Bent & Call Hdw. & Tool Co.:
Dividers 65¢
Calipers, Double. 65¢
Calipers, Inside or Outside. 65¢
Calipers, Wing. 60¢
Compasses 50¢

Conductor Pipe—
L. C. L. to Dealers:
Territory. Noted. Not noted.
Eastern 70¢
Central 70¢
Southern 70¢
So. Western. 60¢

Copper. 14¢
Eastern 50¢
Central 50¢
Southern 50¢
So. Western. 50¢
Terms, 60 days; 2% cash 10 days.
Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—
Gal. each. 2 3 4 6 8
Labrador. \$1.20 \$1.50 \$1.80 \$2.10 \$2.70
Gal. 3 4 6 8
Iceland, ea. \$1.80 \$2.10 \$2.40 \$3.00
Gal. 2 3 4 6 8
Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.90 \$3.90
Galvanized, Lined, side handles,
Gal. 2 3 4 6 8
Each \$1.95 \$2.15 \$2.40 \$3.30 \$4.15
White Enamelled. 25¢
Agate Lined. 25¢

Coopers' Tools—
See Tools, Coopers'.
Coppers' Soldering—
Soldering Coppers, 3 lbs. to pair
and heavier, 20¢; 2 1/2 lbs. to pair,
lighter than 3 lbs. to pair. 22¢
Cord— Sash—
Braided, Drab. 10¢
Braided, White, Com. 10¢
to 15. 10¢
Cable Laid Italian. 10¢
to 15. 10¢
Common India. 10¢
Cotton Sash Cord, Twisted. 17¢
Patent Russia. 10¢
Cable Laid Russia. 10¢
India Hemp, Braided. 10¢
India Hemp, Twisted. 10¢
Patent India, Twisted. 10¢
Annie Cordage Co.:
Old Glory, Nos. 7 to 15. 2¢
Anniston, Nos. 7 to 15. 2¢
2 1/2¢; No. 6, 2 1/2¢; No. 7, 2 1/2¢;
Drab, Nos. 7 to 15. 2¢
Anniston Mahogany, 27¢
Pearl Braided, cotton, No. 6, 3¢
2 1/2¢; No. 7, 2 1/2¢; Nos. 8 to 12, 2 1/2¢
Edystone Braided, Nos. 8, 9 and
10. 2 1/2¢; 7, 2 1/2¢; 6, 2 1/2¢
Harmony Cable Laid Italian, Nos. 7
to 10. 10¢
Peerless:
Cable Laid Italian. 10¢
Cable Laid Russian. 10¢
Cable Laid India. 10¢
Braided India. 10¢
Pullman:
Wire Sash Cord. 10¢
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton. 10¢
Braided, Russian Hemp. 10¢
Braided, Linen. 10¢
Braided, White Cotton or Spot. 10¢
Massachusetts, White. 10¢
Massachusetts, Drab. 10¢
Phenix, White, Nos. 8 to 12, 2 1/2¢;
No. 2 1/2¢; No. 6, 2 1/2¢
Silver Lake:
A quality, Drab. 40¢
A quality, White. 35¢
B quality, Drab. 35¢
B quality, White. 30¢
Linen Hemp. 37¢
Linen 37¢
See also Chain and Ribbon.

Wire, Picture—
List Oct., '00. 85¢
Hendryx Standard Wire Picture Cord.
85¢
Cradles—
Grain 40¢
Crayons—
White Round Crayons, gr. 60¢
Cases, 100 gro., \$5.00 at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons. 35¢
Metal Workers' Crayons, gr. \$2.50
Soapstone Pencils, round, flat
or square. \$1.50
Rolling Mill Crayons. \$2.50
Railroad Crayons (composition). \$2.00
Zelnicke's Lumber:
Red, Blue, Green. 50¢
Black 50¢
See also Chalk.

Crooks, Shepherds—
Fort Madison, Heavy. 30¢
Fort Madison, Light. 30¢
Crow Bars—See Bars, Crow.
Cultivators—
Victor Garden. 50¢
Cutlery, Table—
International Silver Company:
No. 12 M'd'm Knives, 1817. 30 doz. \$3.50
Star, Eagle, Rogers & Hamilton
and Anchor 30 doz. \$3.00
Wm. Rogers & Son. 30 doz. \$2.50
Cutters— Glass—
H. H. Mayhew Co. 40¢
Red Devil. 50¢
Woodward 40¢
Meat and Food—
American 30¢
Each. \$5 \$7 \$10 \$25 \$50 \$100
Enterprise 25¢
Nos. 5 10 15 20 25 30
Each. \$3 \$5 \$7 \$10 \$15 \$20
Dixon's 30¢
Nos. 1 2 3 4 5
\$14.00 \$17.00 \$19.00 \$30.00
Ideal 40¢
Little Giant. 40¢
Nos. 300 310 315 320 322
\$35.00 \$48.00 \$44.00 \$72.00 \$98.00
N. E. Food Choppers. 25¢
New Triumph No. 605. 30 doz. \$24.00.
40¢
Russwin Food, No. 1, \$24.00; No. 2,
\$27.00. 45¢
Woodruff's 40¢
Nos. \$15.00 \$18.00
Enterprise Beef Shavers. 25¢
Slaw and Kraut—
Henry Diston & Sons:
Slaw, Corn Grater, &c. 40¢

**Kraut Cutters, 24 x 7, 26 x 8, 30
x 9. 55¢
Kraut Cutters, 36 x 12, 40 x 12. 55¢
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife. 30¢
Combined Slaw Cutter and Corn
Grater 40¢
Tucker & Dorsey Mfg. Co.:
Kraut Cutters. 40¢
Slaw Cutters, 1 Knife. 30¢
Slaw Cutters, 2 Knives. 32¢**

Tobacco—
All Iron, Cheap. 40¢
Enterprise 30¢
National, 3 doz. No. 1, \$21; No. 2,
\$18. 40¢
Sargent's, 3 doz. No. 2. 60¢
Sargent's, Nos. 12 and 21. 60¢
Washer—
Appleton's, 3 doz. \$16.00. 50¢
Diggers, Post Hole, &c.—
Dalbey Post Hole Auger, per doz. \$9.00
Iwan's Imp'd Post Hole Auger 40&5
Iwan's Vaughan Pattern Post Hole
Augers 30¢
Iwan's Perfection Post Hole Digger. 30¢
Iwan's Split Handle Post Hole Dig-
gers 30¢
Kohler's Universal 14¢
Kohler's Little Giant. 12¢
Kohler's Hercules. 10¢
Kohler's Invincible. 9¢
Kohler's Rival. 8¢
Kohler's Pioneer. 7¢
Never-Break Post Hole Diggers, 3
doz. \$24.00. 25¢
Samson, 3 doz. \$34.00. 25¢
Dividers—See Compasses.
Doors, Screen—
Phillips', style E, 3/4 in. 10¢
Phillips', style 077, 3/4 in. 10¢
Phillips', style x-y, 3/4 in. 10¢
Drawers, Money—
Tucker's Pat. Alarm Till No. 1, 30
doz. \$15; No. 2, \$15; No. 3, \$12;
No. 4, \$18.
Drawing Knives—
See Knives, Drawing.
Dressers, Emery Wheel—
Diamond Emery Wheel Dressers. 35¢
Diamond Wheel Dresser Cutters. 35¢
Drills and Drill Stocks—
Common Blacksmiths' Drill,
each \$1.50 @ \$1.75
Breast, Millers' Falls. 15¢
Breast, P. S. & W. 40¢
Goodell Automatic Drills. 40¢
Johnson's Automatic Drills, Nos. 2
and 3. 16¢
Johnson's Drill Points. 16¢
Millers' Falls Automatic Drills. 35¢
Ratchet, Curtis & Curtis. 25¢
Ratchet, Parker's. 40¢
Ratchet, Weston's. 40¢
Ratchet, Weston's, Style H Im-
proved. 40¢
Ratchet, No. 012. 40¢
Ratchet, Whitney's, P. S. & W. 50¢
Whitney's Hand Drill, No. 1, \$10.00;
Adjustable, No. 10. 35¢
Twist Drills—
Bit Stock. 60¢
Taper and Straight Shank. 60¢
Drivers, Screw—
Screw Driver Bits, per doz. 45¢
Balsey's Screw Holder and Driver, 3/8
doz., 2 1/2-in., \$9; 4-in., \$7.50; 6-in.,
\$9
Buck Bros.' Screw Driver Bits. 30¢
Champion 50¢
Edson 50¢
Fray's Hol'd'dle Sets, No. 3, \$12.50
Fray's Double Action Ratchet. 35¢
Goodell's Auto. 50¢
Hurwood 40¢
Mayhew's Black Handle. 40¢
Mayhew's Monarch. 40¢
Millers' Falls, Nos. 20 and 21. 25¢
Millers' Falls, No. 11, 12, 41, 42. 15¢
New England Specialty Co. 50¢
Sargent & Co.'s:
Nos. 1 and 60. 50¢
Nos. 50, 53 and 55. 60¢
Nos. 20 and 40. 70¢
Smith & Hemenway Co. 40¢
H. D. Smith & Co.'s Perfect H'd'dle. 40¢
Stanley B. & L. Co.'s:
No. 64, Varn. Handles. 65¢
No. 88. 75¢
Victor 55¢
Defiance 70¢
Swan's:
Nos. 7565 to 7568. 50¢
No. 7549. 10¢
Eave Trough, Galvanized—
Territory. L. C. L.
Eastern 80¢
Central 75¢
Southern 75¢
So. Western. 75¢
Terms—2% for cash. Factory ship-
ments generally delivered.
See also Conductor Pipe and Elbows.
Elbows and Shoes—
Factory shipments, all territories:
Gate, Steel and Gate, O. C.
Iron and Steel, Standard
Gauge 60¢
No. 26. 35¢
No. 21. 25¢
No. 22. 10¢
Copper 37¢
Perfect Elbows (S. B. & Co.). 40¢
Emery, Turkish—
40¢
Keys 5¢
1/2 Keys. 5¢
1/4 Keys. 5¢
10-lb. cans. 7¢
10 in case. 7¢
10-lb. cans, less
than 10. 8¢
Less quantity. 8¢
NOTE.—In lots 1 to 3 tons a discount
of 10% is given.
Extractors, Lemon Juice
—See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's 50&10%
Walling's 40&10%
Cord and Weight—..... 40%

Faucets—

Cork Lined 50&10%
Metallic Key, Leather Lined 60&10%
Red Cedar 40&10%
Petroleum 70&10%
B. & L. B. Co.: 60&10%

Star 50&10%
John Sommer's Peerless Tin Key 50%
John Sommer's Boss Tin Key 50%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 50%
John Sommer's I. L. Co. Lined 50%
John Sommer's Reliable Cork Lined 50&10%

John Sommer's Chicago Cork Lined 50%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 50%
McKenna, Brass:

Burglar Proof, N. P. 25%
Improved, 3/4 and 1/2 inch 25%
Self Measuring:

Enterprise, 1/2 doz. \$36.00 40&10%
Lane's, 1/2 doz. \$36.00 40&10%
National Measuring, 1/2 doz. \$36.00 40&10%

Felloe Plates—
See Plates, Felloe.

Files— Domestic—
List revised Nov. 1, 1899.

Best Brands 70&10%
Standard Brands 75&10%
Lower Grade 75&10%

Imported—
Stubs' Tapers, Stubs' Hat, July 24, '97 33 1-3 @ 40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 105 \$3.75
Special, No. 104 \$3.75
Fusible Links, No. 96 60%
Expansion Bolts, No. 107 60&10%

Grindstone—
Net Prices:

Inch 15 17 19 21 23
Per doz. \$2.15 2.85 3.25 3.75 4.50
P. S. & W. Co. 30&10%
Reading Hardware Co. 60%
Sargent's 70%
Stowell's Giant Grindstone Hanger 40 doz. \$6.00

Stowell's Grindstone Fixtures, Extra Heavy 50&10%
Stowell's Grindstone Fixtures, Light 60&10%

Fodder Squeezers—
See Compressors.

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato 60&10%
Victor, Hay 60&10%
Victor, Manure 60&10%
Victor, Header 60%
Champion, Hay 60%
Champion, Header 60%
Champion, Manure 60&10%
Columbia, Hay 60&10%
Columbia, Manure 60&10%
Columbia, Spading 70&10%
Hawkeye Wood Barley 40%
W. & C. Potato Digger 60&10%
Acme Hay 60&10%
Acme Manure, 4 tine 60&10%
Dakota Header 60&10%
Jackson Steel Barley 60&10%
Kansas Header 60%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz. 75¢ @ 80¢
Red, S'g't Bar, per doz. \$1.00 @ 1.25
Red, Dbl. Brace, per doz. \$1.40 @ 1.50

Freezers, Ice Cream—
Qt. 1 2 3 4 6
Each \$1.30 \$1.60 \$1.90 \$2.20 \$2.80

Fruit and Jelly Presses—
See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse— Per 1000 Feet.
Hemp \$2.75
Cotton 3.20
Waterproof Spl. Taped. 3.65
Waterproof Dbl. Taped. 4.40
Waterproof Tpl. Taped. 3.15

Gates, Molasses and Oil—
Stebbins' Pattern. 80&10% @ 80&10&5%

Gauges—
Marking, Mortise, &c. 50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. 50&10% @ 50&10&5%
Scholl's Patent 50&10%
Door Hangers 50&10%
Stanley R. & L. Co.'s Butt and Rabbit Gauge 30%
Marking and Mortise 60%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire, P. S. & W. Co. 34%

Gimlets— Single Cut—
Numbered assortments, per gro.

Nail, Metal, No. 1, 22.00; 2, 23.30
Spike, Metal, No. 1, 24.00; 2, 24.30
Nail, Wood Handled, No. 1, 22.30; 2, 22.60
Spike, Wood Handled, No. 1, 24.30; 2, 24.60

Glass, American Window
See Trade Report.

Glasses, Level—
Chapin-Stephens Co. 60&10% @ 10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush 25&50%
Cans (1/2 pts., pts., qts., 1/2 gal., gal.) 25&18%
International Glue Co. (Martin's) 40%

Grease, Axle—
Common Grade gro. \$4.50 @ 5.50
Dixon's Everlasting, 10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, 1/2 doz. 1 lb. \$1.20; 2 lb. \$2.00
Helmet Hard Oil 25%

Grips, Nipple—
Perfect Nipple Grips 40&10&2%

Griddles, Soapstone—
Pike Mfg. Co. 33% @ 33&10%

Grindstones—
Bicycle Emery Grinder \$6.50
Bicycle Grindstones, each \$2.50 @ 3.50
Pike Mfg. Co.:
Improved Family Grindstones, 1/2 inch, 1/2 doz. \$2.00 }
Pike Mower and Tool Grinder, each \$6.00 }
Velox Rail Bearing, Mounted, Angle Iron Frames, each \$3.00

Halters and Ties—
Cow Ties 60 @ 60&10%
Covert Mfg. Co.:
Web 35&60%
Jute Rope 30&10%
Cotton Rope 45%
Hemp Rope 45%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Sisal Rope Halters 60&20%
Jute, Manila and Cotton Rope Ties 70%
Sisal Rope Ties 60&10%
Oneida Community:
Am. Coll and Halters 40 @ 40&5%
Am. Cow Ties 45 @ 50%
Niagara Coll and Halters 45 @ 50&5%
Niagara Cow Ties 45 @ 50&5%
E. T. Rugg & Co.:
Leather Halters 50%
Web Halters and Webbing 60%
Jute and Sisal Rope Halters 60%
Jute and Sisal Horse and Cattle Ties 60%
Cotton Horse Ties 60%
Livery Ties, Braided 60%

Hammers—
Handled Hammers—
Heller's Machinists' 40&10% @ 40&10%
Heller's Farriers' 40&10% @ 40&10%
Magnetic Tack, Nos. 1, 2, 3, 1 1/2, 2 1/2, 3 1/2 50%
Peck, Stow, Wilcox, Steel 50%
Fayette R. Plumb:
Plumb, A. E. Nail 33% & 71% @ 33% & 10&7%
Engineers' and R. S. Hand 50&7% @ 50&10%
Machinists' Hammers 50&5% @ 50&10&5%
Riveting and Timbers 40&2% @ 40&10&2%
Sargent's C. S. New List 40%

Heavy Hammers and Sledges—
Under 3 lb., per lb. 50¢ 80&10% @ 80&5%
3 to 5 lb., per lb. 40¢ 80&10% @ 80&5%
Over 5 lb., per lb. 30¢ 85 @ 85&10%
Wilkinson's Smith's lb. 9¢ @ 10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c. 60&5% @ 60&10&5%
Hoe, Rake, &c. 45 @ 50&5%
Fork, Shovel, Spade, &c. 45 @ 50&5%
Long Handles 45 @ 50&5%
D Handles 40%
Cross-Cut Saw Handles
Atkins' 40%
Champion 45 @ 45&10%
Dixson's 50%

Mechanics' Tool Handles—
Auger, assorted gro. \$2.50 @ 2.85
Brad Avl. gro. \$1.65 @ 1.85
Chisel Handles:
Apple Tanged Firmer, gro. assorted \$2.40 @ 2.65
Hickory Tanged Firmer, gro. assorted \$2.15 @ 2.40
Apple Socket Firmer, gro. assorted \$1.75 @ 1.95
Hickory Socket Firmer, gro. assorted \$1.45 @ 1.60
Hickory Socket Framing, gro. assorted \$1.60 @ 1.75
File, assorted gro. \$1.30 @ 1.40
Hammer, Hatchet, Axe, &c. 60&10% @ 60&10&5%

Hand Saw, Varnished, do. 80¢ @ 85¢; Not Varnished 63 @ 75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool 40 @ 40&10%
Chisel 65 @ 65&10%
File and A. W. L. 40 @ 40&10%
Saw and Plane 40 @ 40&10%
Screw Driver 40 @ 40&10%
Millers Falls Adj. and Ratchet Auger Handles 15&10%
Nicholson Simplicity File Handle 1/2 gro. \$0.95 @ 1.10

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and for door hangers per double set with track, &c.
Barn Door, New Pattern, Round Groove, Regular:
Inch 3 4 5 6 8
Single Doz. \$0.90 1.25 1.60 1.95 2.50
Barn Door, New England Pattern, Check Back, Regular:
Inch 3 4 5 6
Single Doz. \$1.30 1.55 2.50 3.00
Allith Mfg. Co.:
Reliable, No. 1 per doz. \$9.00
Reliable, No. 2 per doz. \$9.00

Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 30%
Crunk & Carrier Mfg. Co.:
Loose Axle 60&10%
Roller Bearing 70%
Griffin Mfg. Co.:
Solid Axle, No. 10, \$12.00 70%
Roller Bearing, No. 11, \$15.00 70%
Roller Bearing, Ex. H., No. 22, \$18.00 70%
Hinged Hangers, \$16.00 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing \$4.00
Parlor, Standard \$3.15
Parlor, No. 105 \$2.85
Parlor, New Model \$2.80
Parlor, New Champion \$2.25
Barn Door, Standard 60&5%
Hinged net \$6.40
Covered 60&2%
Special 70&3%
Lawrence Bros.:
Advance 60&10%
Cleveland 75%
Clippers, No. 75 60%
Crown 60&10%
Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25 No.
Giant 60&5%
Hummer 70&5%
New York 60&10%
Peerless 75%
Sterling 60&10%
McKinney Mfg. Co.:
No. 1, Special, \$15 60&10%
No. 2, Standard, \$18 60&10%
Hinged Hangers, \$16 50%
Meyers' Stayon Hangers 60&5%
Richards Mfg. Co.:
Pioneer Wood Track No. 3, \$2.00
Ball B'r'g St'l Track No. 10, \$4.00
Roller B'r'g St'l Track No. 12, \$2.15
Roller B'r'g St'l Track No. 13, \$2.30
Holler, Adj. Track No. 19, \$5.00
Adjustable Track Tandem Trolley Track No. 16 50&10%
Seal, Steel Track No. 8 \$2.25
Auto Adj. Track No. 22, \$5.00
Trolley B. D. No. 17 \$1.25
Trolley F. D. No. 120 \$2.10
Trolley F. D. No. 121 \$2.25
Trolley F. D. No. 150 \$2.35
Safety Underwriters F. D. No. 101 50%
Tandem No. 44, 2 1/2 and 3 1/2 No. 102
Palace, Adjustable Track No. 132 50&10%
Royal, Adjustable Track No. 122 60&10%
Ives' Wood Track No. 1 \$2.00
Trolley B. D. No. 20 50&10%
Trolley B. D. No. 24 \$1.30
Trolley B. D. No. 27 \$1.40
Trolley B. D. No. 28 \$1.60
Roller Bearings No. 39, 41, 43 75%
Anti-friction No. 42 60&20%
Hinged Tandem No. 48 60&5%
Folding Door B. B. Swivel No. 135 40%
Sentry Door Hanger Co.:
Storm King 60%
U. S. Standard Hinge 60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing 40%
Ajax Hinge Door 60%
Apex Parlor Door 50&10&5%
Baggage Car Door 50%
Climax Anti-Friction 50&10%
Elevator 40%
Express 60%
Freight Car Door 60%
Intestate 60&10%
Lundy Parlor Door 50&10%
Magic 60%
Matchless 60&10%
Nansen 70&5%
Parlor Door 50&10%
Rex Hinge Door 50&10%
Street Car Door 50%
Steel, Nos. 300, 404, 500 50&10%
Underwriters' Fire Door 40%
Wild West Warehouse Door 50%
Zenith for Wood Track 50&10%

A. L. Sweet Iron Works:
Check Back 70%
Climax Anti-Friction 50&10%
Eagle 70%
Hylo Hinge 60%
New Perfection 60%
Pilot 60%
Pilot Hinge 60%
Rider Wooster 65%
Western Pattern 70%
Taylor & Boggs Fy Co.'s Kidder's Roller Bearing, 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing, 1/2 doz. \$5.00
C. J. Roller Bearing 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 50%
Ives Wood Track 60&10%
L. T. Roller Bearing 60&10&5%
New Era Roller Bearing 50&10%
O. K. Roller Bearing 60&10&5%
Prindle Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track 50&10%
Spencer Roller Bearing 60&10%
Tandem No. 2 60%
Underwriters' Roller Bearing 40%
Velvet 50%
Wilcox Auditorium Ball B'r's 20%
Wilcox Barn Trolley No. 123, 40
Wilcox Elev. Door, Nos. 112 and 122 40%
Wilcox Elev. Door No. 137 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century 50&10%
Wilcox O. K. Steel Track 50%
Wilcox O. K. Trolley 50%
Wilcox Trolley Ball Bearing 40%
Wilcox Wideman Narrow Gauge Ball Bearing 40%
For Track, see Rail.

Hangers— Garment—
Pullman Trouser, 1/2 gro., 1 pair Flat Alumin. \$9.00; 1 pair Round Nickle, \$2.00; 4 pair Round Nickle, \$2.00
Victor Folding 1/2 gro. \$9.00
Western, W. G. Co. 70&10%

Gate—

Myers' Patent Gate Hangers, 1/2 doz. net \$4.50
Joist and Timber—
Lane Bros. Co. 30%

Hasps—
Griffin's Security Hasp 50%
McKinney's Perfect Hasp, 1/2 doz. 50%

Hatchets—
Regular list, first quality, 40¢ @ 75%
Second quality \$1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, \$1.75; No. 5B, \$2.00; No. 3, \$2.25; No. 3D, \$2.75; No. 1D, \$3.00; No. 3E, \$3.25; No. 1, \$3.50 15%
Clark Coal, 1/2 doz. \$0.75 10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)
No. 1 2 3 5
Doz. pair \$0.75 1.35 2.70

Mortise Shutter:
(L. & P., O. S., Dixie, &c.)
No. 1 1 1/2 2 2 1/2
Doz. pair \$0.70 .65 .60 55

Mortise Reversible Shutter (Buffalo, &c.):
No. 1 1 1/2 2
Doz. pair \$0.70 .65 .60 55

North's Automatic Blind Fixtures,
No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50 10%
Charles Parker Co. 70&15%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 50%
Hale's Blind Awning Hinges, No. 110, for wood, \$9.00; No. 111, for brick, \$9.00 20%
Reading's Gravity 60%
Sargent's, Nos. 1, 3, 11 and 13, 75&10%
Stanley's Steel Gravity Blind Hinges, 1/2 doz. sets, without screws, \$0.90; with screws, \$1.20 75&10%
Wrightsville Hardware Co.:
O. S., Lull & Porter 75&10&5%
Acme, Lull & Porter 75&10%
Queen City Reversible 75&10%
Shepard's Noiseless, Nos. 60, 65, 66 75&10%
Niagara Gravity Locking, Nos. 1, 3 & 5 75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5 75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 75&10&5%
Shepard's Double Locking, Nos. 20 & 25 70%
Champion Gravity Locking, No. 75, 75%
Steamboat Gravity Locking, No. 10, 75%
Pioneer, Nos. 60, 65 & 66 75%
Empire, Nos. 101 & 103 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:
No. 1 2 3
Hinges with L's \$2.00 2.70 5.00
Hinges only 1.40 2.05 3.80
Latches only70 .70 .35

New England:
With Latch doz. @ \$2.00
Without Latch doz. @ \$1.60

Reversible Self-Closing:
With Latch doz. @ \$1.75
Without Latch doz. @ \$1.35

Western:
With Latch doz. \$1.75
Without Latch doz. \$1.15

Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets, 2 3
Hinges with Latches, No. 20 2.70 5.00
Hinges only 1.40 2.05 3.80
Latches only70 .70 1.35

Pivot Hinges—
Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 45%

Spring Hinges—
Holdback Cast Iron gro. \$9.00 @ \$9.50
Non-Holdback, Cast Iron gro. \$3.00 @ \$3.50

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 15%
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges 40%
No. 900 Wrot, Steel Hold Back, 1/2 gr. \$9.00

Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme Wrought Steel 30%
Acme, Brass 25%
American 25%
Columbia, No. 14 1/2 gr. \$9.00
Columbia, No. 18 1/2 gr. \$25.00
Columbia, Adjustable, No. 7 1/2 gr. \$12.00

Gem, new list 1/2 gr. \$12.00
Clover Leaf 1/2 gr. \$12.00
Oxford, new list 1/2 gr. \$12.00
Lawson Mfg. Co. Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door 1/2 gr. \$9.00
Ball Bearing Floor Hinge 40%
Ohio Detachable Screen Door Hinge 1/2 gr. \$12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, 1/2 gr. \$12.50
Ideal, No. 4 1/2 gr. \$9.00
New Idea No. 1 1/2 gr. \$9.00
New Idea, Double Acting 45%
New Idea Floor 45%
Van Wagener:
Ball Bearing 25%
No. 777 Sh't Steel Hold'b'k, 1/2 gro. pr. \$9

Extra 50% often given.

Extra 10% often given on most of these Hinges.

Slater's Felt (roll 500 sq. ft.) .75¢
R. E. M. Stone Surfaced Roofing
(roll 110 sq. ft.) .25¢

Sand and Emery

Flint Paper and Cloth .60¢@.60¢
Garnet Paper and Cloth .25¢
Emery Paper and Cloth .50¢@.60¢

Parers—Apple—

Advance doz. \$4.00
Hawdwin doz. \$4.00
Bonanza Improved doz. \$4.00
Daisy doz. \$4.00
Dandy doz. \$20.00
Eureka Improved doz. \$7.50
Family Bay State doz. \$15.00
Improved Bay State doz. \$36.00
Little Star doz. \$5.00
New Lightning doz. \$7.00
Reading 72 doz. \$3.25
Reading 75 doz. \$6.25
Rocking Table doz. \$6.25
Turn Table 98 doz. \$6.00
White Mountain doz. \$5.00

Potato—

Saratoga doz. \$7.00
White Mountain doz. \$6.00

Picks and Mattocks—

List Feb 23, 1899 75¢@75¢
Cronk's Handled Garden Mattock doz. \$6.40
Cronk's 33%

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass 60¢@60¢
Iron, list Nov. 11, '85 60¢@60¢

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in. 60%
Extra Heavy, 2-6 in. 70%
Fittings 75%

Pipe, Merchant—

Carload Lots.
Steel. Iron.
1/4 & 1/2 in. 51% 65% 49%
3/4 & 1 in. 71% 59% 69%
1 & 1 1/2 in. 75% 65% 73%
1 3/4 & 2 in. 70% 55% 68%
2 to 12 in. 75% 65% 73%

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2
to 24 in.:
New England 65%
New York and New Jersey 71%
Maryland, Delaware, E. Pa. 75%
West. Pa. and West Va. 71%
Virginia 76%
Ohio, Michigan and Ky. 77%
Indiana 77%
NOTE.—Carload lots are generally de-
livered.

Pipe, Stove—

Edwards' Nested Stove Pipe:
C. L. L. C. L.
5 in., per 100 joints . . . \$7.00 \$8.00
6 in., per 100 joints . . . 7.50 8.50
7 in., per 100 joints . . . 8.50 9.50

Planes and Plane Irons—

Wood Planes—
Bench, first qual. 40¢@10¢
Bench, second qual. 50¢@10¢
Molding 35¢@40¢
Bailey's (Stanley R. & L. Co.) 40%
Chapin-Stephens Co.:
Bench, First Quality 40¢@40¢
Bench, Second Quality 50¢@50¢
Molding 35¢@35¢
Toy and German 40¢@40¢
Chaplin's
Ohio Tool Co.:
Bench, First Quality 40¢@40¢
Bench, Second Quality 50¢@50¢
Molding 35¢@35¢
Adjustable Wood Bottom 60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) 40%
Chaplin's Iron Planes 50¢@10¢
Miscellaneous Planes (Stanley R. & L. Co.) 35%
Ohio Tool Co.'s Iron Planes 60%
Sargent's 60¢@10¢
Union 60%

Plane Irons—

Wood Bench Plane Irons—
Buck Bros. 25¢@10¢
Chapin-Stephens Co. 30¢@30¢
Ohio Tool Co. 30%
Stanley R. & L. Co. 35%
Union 50%
L. & I. J. White 25¢@25%

Planters, Corn, Hand—

Kohler's Eclipse doz. \$3.50

Plates—

Felco lb. 3¢@14¢
Self-Sealing Pie Plates (S. & S. Co.) doz. \$2.00 . . . 50%

Pliers and Nippers—

Button Pliers 75¢@10¢
Gas Burner, per doz. 5 in. . . \$1.25
@ \$1.30; 6 in. . . \$1.45 @ \$1.50.
Gas Pipe 7 8 10 12-in.
\$2.00 \$2.25 \$3.00 \$3.75
Acme Nippers 50¢@5%
Cronk & Carrier Mfg. Co.:
American Button 75¢@10%
Cronk's 60%
Stub's Pattern 35%
Combination and others 35%
Heller's Farriers' Nippers, Pincers
and Tools 40¢@10¢
P., S. & W. Timmer's Cutting Nip-
pers 40%
Swedish Slide, End and Diagonal Cut-
ting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels 30¢@30¢
Chapin's Imp. Brass Cor. 40¢@40¢
Pocket Levels 30¢@30¢
Diston's Plumbs and Levels 70%
Diston's Pocket Levels 70%
C. E. Jennings & Co.'s Iron 35%

C. E. Jennings & Co.'s Iron, Adjust-
able 40¢@7%
Stanley R. & L. Co. 45%
Stanley's Duplex 35%
Woods' Extension 35%

Poachers, Egg—

Buffalo Steam Egg Poachers, 30 doz.,
No. 1, \$6.00; No. 2, \$9.00; No. 3,
\$9.00; No. 4, \$12.00 50%

Points, Glaziers—

Bulk and 1-lb. papers, lb. 8 1/2¢@9¢
1/4-lb. papers lb. 9¢@9 1/2¢
1/4-lb. papers lb. 9 1/2¢@10 1/4¢

Pokes, Animal—

Ft. Madison Hawkeye doz. \$3.25
Ft. Madison Western doz. \$4.00

Police Goods—

Manufacturers' Lists 25¢@25¢
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder),
each, \$1.25; 30 doz. \$37.50; No. 2, 10 lb
can (cake), each, \$2.50; 3 doz. \$7.50.
Prestolite Liquid, No. 1 (1 qt.), \$2.12 . . . 40%
Prestolite Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz.
boxes, 30 doz. \$9.00; 1 doz. \$4.50;
1/2 lb boxes, 30 doz. \$1.25; 1 lb
boxes, 30 doz. \$2.25.
U. S. Liquid, 3 oz. cans, 30 doz.,
\$1.25; 30 doz. \$36.00.
Barkkeepers' Friend Metal Polish, 30
doz., \$1.75; 30 doz. \$51.00.
Wynn's White Silk, 1/2 pt. cans, 30
doz. 2.00

Stoves—

Black Eagle Benzine Paste, 5 lb cans,
30 doz. \$7.50
Black Eagle, Liquid, 1/2 pt. cans,
30 doz. \$7.50
Black Jack Paste, 1/2 lb cans, 30 doz. \$9.00
Black Kid Paste, 5 lb cans, each, \$9.00
Ladd's Black Beauty Liquid, per
100 tins \$6.75
Joseph Dixon's, 30 gr. \$5.75 . . . 10%
Dixon's Plumbago 10%
Fireside 10%
Gem, 30 gr. \$4.50 10%
Japanese 10%
Jet Black 10%
Peerless Iron Enamel, 10 oz. cans,
30 doz. \$1.50

Wynn's:

Black Silk, 5 lb pail each 70¢
Black Silk, 1/2 lb box doz. \$1.00
Black Silk, 5 oz. box doz. \$0.75
Black Silk, 1/4 pt. liq. doz. \$1.00

Poppers, Corn—

1 qt., Square gro. \$9.00
1 qt., Round gro. \$10.00
1/2 qt., Square gro. \$11.00
2 qt., Square gro. \$13.00

Post Hole and Tree Au- gurs and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢;
6 ft., 46¢; 6 1/2 ft., 48¢.
Steel Hitching Posts each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb each 45¢
Fine Sporting, 1 lb each 75¢
Rifle, 1/2 lb each 25¢
Rifle, 1 lb each 25¢
In Kegs:
12 1/2-lb. kegs \$3.50
25-lb. kegs \$4.50
King's Semi-Smokeless:
Keg (25 lb bulk) \$6.50
Half Keg (12 1/2 lb bulk) \$3.50
Quarter Keg (6 1/4 lb bulk) \$1.90
Case 24 (1 lb cans bulk) \$4.50
Half case (1 lb cans bulk) \$4.50
King's Smokeless:
Keg (25 lb bulk) \$6.50
Half Keg (12 1/2 lb bulk) \$3.50
Quarter Keg (6 1/4 lb bulk) \$1.90
Case 24 (1 lb cans bulk) \$4.50
Half case (1 lb cans bulk) \$4.50
Robin Hood Sm'less Shot Gun 50¢@20%

Presses—

Enterprise Mfg. Co. 20¢@25%

Fruit and Jelly—

Seal Presses—
Morrill's No. 1, 30 doz. \$20.00 . . . 50%

Pruning Hooks and Shears

See Shears.

Pullers, Cork—

Invincible Cork Puller \$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falla, No. 3, 30 doz. \$12.00 . . . 33%
Morrill's No. 1, Nail Puller, 30 doz. \$20.00 . . . 50%
Pearson No. 1, Cyclone Spike Puller,
each \$30.00 50%
Pelican, 30 doz. \$9.00 40%
Scranton, Case Lots:
No. 2B (large) \$5.50
No. 3B (small) \$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots doz. \$4.00
Diamond B, No. 3, case lots doz. \$5.50
Giant No. 1, 30 doz. \$15; No. 2,
\$15.50; No. 3, \$15 33%
Staple Puller 60%
Parrot Tack and Stub Puller, 30 doz. \$7.50 . . . 75%
30 doz. \$22.50

Pulleys, Single Wheel—

Inch 1/4 1/2 3/4 2 3
doz. \$0.30 .35 .60 1.05
Hay Fork Sievel or Solid Eye.
doz. 1 in. \$1.25; 5 in. \$1.55
Inch 2 2 1/2
Hot House, doz. \$0.60 .85 1.80
Inch 1 1 1/2 2
Sorens, doz. \$0.16 .20 .23 .50

Inch 1/4 2 2 1/2 2 1/2
Side, doz. \$0.25 .40 .55 .60

Sash Pulleys—

Stowell's:
Ceiling or End, Anti-Friction . . . 60¢@10%
Dumb Waiter, Anti-Friction . . . 60¢@10%
Electric Light 60%
Side, Anti-Friction 60¢@10%

Common Frame; Square or Round End, per doz, 1 1/4 and 2 in. 16¢@19¢

Auger Mortise, no Face Plate,
per doz. 1 1/4 and 2 in. 16¢@19¢

Acme 1 1/4 in. 16¢; 2 in. 19¢

Fox-All-Steel, Nos. 3 and 4, 2 in. 19¢

Grand Rapids All Steel Noiseless . . . 50%

Ideal 70¢@10%

Niagara 1 1/4 in. 16¢; 2 in. 19¢

No. 28, Troy 1 1/4 in. 16¢; 2 in. 19¢

Star 1 1/4 in. 16¢; 2 in. 19¢

Tackle Blocks—See Blocks.

Pumps—

Cistern 60¢@60¢@10%

Pitcher Spout 80¢@80¢@10%

Wood Pumps, Tubing, &c. 45¢@50%

Barnes Dbl. Acting (low list) 50%

Barnes' Pitcher Spout 75¢@10¢

Contractors' Rubber Diaphragm No.
2, B. & L. Block Co. \$16.00

Daisy Spray Pump doz. \$6.75

Flint & Walling's, Fast Mail Hand
(low list) 55%

Flint & Walling's Fast Mail (low
list) 55%

Flint & Walling's Tight Top Pitcher . . . 80%

National Specialty Mfg. Co., Measur-
ing 30%

Mechanical Sprayer \$6.00

Myers' Pumps (low list) 50%

Myers' Power Pumps 50%

Myers' Spray Pumps 50¢@10%

Pump Leathers—

Plunger and Lower Valve—Per
gro.:
Inch 2 2 1/2 2 1/2 2 1/2
\$2.20 2.50 2.75 3.00

Inch 3 3 1/2 3 1/2 3 1/2
\$3.30 3.60 3.85 4.10 4.40

Plunger Cup Leathers—Per 100:
Inch 2 1/2 3 3 1/2 4
\$2.75 3.85 5.00 6.00

Punches—

Saddlers or Drive, good doz. 50¢@75¢

Spring, single tube, good qual-
ity \$1.75@2.00

Revolving (4 tubes) doz. \$3.50@3.75

Bemis & Call Co.'s Cast St'l Drive . . . 50%

Bemis & Call Co.'s Check 55%

Morrill's Nos. 1AA, 1A, 1B, 1C,
1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L,
1M, 1N, 1O, 1P, 1Q, 1R, 1S, 1T, 1U,
1V, 1W, 1X, 1Y, 1Z \$15.00

Hercules each \$5.00 . . . 40%

Niagara Hollow Punches 40%

Niagara Solid Punches 55¢@10%

Steel Screw, B. & K. Mfg. Co. 50%

Tinner's Hollow, P., S. & W. Co. 40%

Tinner's Solid, P., S. & W. Co. 60%

doz. \$1.44 60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange
Screw Holes for Rd. Groove
Wheels:
1/2 3/4 1 in.
\$2.50 \$3.00 \$4.40 100 feet.

Angular for Sq. Groove Wheels:
Small. Med. Large.
\$2.00 \$2.70 \$3.60 100 feet.

Sliding Door, Painted Iron 2 1/2¢@2 3/4¢

Sliding Door, Wrought Brass 30%

1 1/2 in. lb. 35¢ 30%

Allitt Mfg. Co.:
No. 1, Reliable Hgr. Track, 30 ft. 5 1/2¢
No. 2, Reliable Hgr. Track, 30 ft. 1¢

Cronk's:
Double Braced Steel Rail 2¢
O. N. T. Rail 2 1/2¢

Griffin's:
xx 100 ft., 1 x 3-16 in. \$3.00;
1 1/2 x 3-16 in. 3.50.

Hinged Hanger, 30 100 ft., 1 x 3-16
in. \$3.10; 1 1/2 x 3-16 in. \$3.00.

Lane's:
Hinged Track, 30 100 ft., 1 in. \$3.40;
1 1/2 in. \$4.10

O. N. T. 30 100 ft., 1 in. \$2.75; 1 1/2
in. \$3.50; 1 3/4 in. \$4.00

Standard, 1 1/2 in. 100 ft. \$4.00

Lawrence Bros.:
30 100 ft. No. 201, \$4.00; No. 202, \$4.00

New York, 1 x 3-16 in. 30 100 ft. \$2.75

McKinney's:
Hinged Hanger Rail, 30 ft. 11¢ . . . 50%

None Better 30%

Standard 30%

Myers' Stayon Track 60¢@10%

Richards' Mfg. Co.:
Common 1 x 3-16 in. \$2.25; 1 1/2 x
3-16, \$2.50; 1 3/4 x 3-16, \$2.75.

Special Hinged Hanger Rail 60¢@10%

Lag Screw Rail, No. 65 50%

Gauge Trolley Track, 30 ft. No. 31,
9¢; No. 32, 14¢; No. 33, 20¢

Safety Door Hanger Co.'s Storm
King Safety 60%

Safety Door Hanger Co.'s U. S.
Standard 60%

Stowell's:
Cast Rail 30 ft. 1 1/4¢

Steel Rail, Plain 25%

Wrought Bracket, 1 1/2 x 3-16 in. 30 ft. 7¢

Sett's Hyllo, 30 ft. 11¢ 60%

F. L. Steel Rail 30 100 ft. \$3.00

No. 0, 1 x 3-16 30 100 ft. \$2.75

Rakes—

NOTE.—Manufacturers are
selling from the list of September
1, 1904, but many jobbers are still

Wire Rope—

Galvanized 42¢@44¢
Plain 50¢@52¢

Ropes, Hammocks—

Covert Mfg. Co.: 50¢
Jute 50¢@10¢
Sisal 50¢@10¢
Covert Saddlery Works 60¢@5¢

Rulers, Desk—

Stimpson & Son: 30¢@10¢
Boxwood and Maple 30¢@10¢

Rules—

Boxwood 60¢@10¢@10¢
Ivory 35¢@10¢@35¢@10¢@5¢
Chapin-Stephens Co.: 60¢@10¢

Boxwood 60¢@10¢
Flexiford 27¢@10¢@10¢@2¢
Ivory 50¢@10¢@10¢
Miscellaneous 50¢@10¢@10¢
Combination 55¢@10¢
Stationers' 10¢@10¢
Keuffel & Esser Co.: 35¢@10¢
Folding, Wood 35¢@10¢
Lufkin's Steel 50¢@10¢
Lufkin's Lumber 60¢
Stanley R. & L. Co.: 62¢@10¢
Boxwood 45¢
Ivory 45¢
Miscellaneous 60¢
Zig Zag 40¢
Zig Zag, Pin Joint 45¢
Upson Nut Co.: 60¢@10¢
Boxwood 35¢@10¢@35¢@10¢
Ivory 35¢@10¢@35¢@10¢

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Saws—

Atkins: 50¢
Circular 50¢@10¢@60¢
Band 35¢@5¢
Cross Cuts 50¢
Mulay, Mill and Drag 50¢
One-Man Saw 40¢
Wood Saws 40¢
Wood, Compass &c. 40¢
Chapin-Stephens Co.: 30¢@10¢
Turning Saws and Frames 30¢@10¢
Diamond Saw & Stamping Works 30¢@10¢@10¢
Sterling Kitchen Saws 30¢@10¢@10¢
Diston's: 50¢
Circular, Solid and In'sted Tooth 50¢
Band, 2 to 14 in. wide 60¢
Band, 1/4 to 1 1/2 60¢
Crosscuts 50¢
Narrow Crosscuts 50¢
Mulay, Mill and Drag 50¢
Framed Woodsaws 35¢
Woodsaw Blades 35¢
Woodsaw Rods 25¢
Hand Saws, Nos. 12, 90, 9, 16, 100 25¢
D4, 120, 76, 77, 8 25¢
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1 30¢
Compass, Key Hole &c. 35¢
Butcher Saws and Blades 35¢
C. E. Jennings & Co.: 25¢
Back Saws 25¢
Butcher Saws 30¢
Compass and Key Hole Saws 35¢
Framed Wood Saws 25¢
Hand Saws 25¢
Wood Saw Blades 35¢
Millers Falls: 15¢@10¢
Butcher Saws 15¢@10¢
Star Saw Blades 15¢@10¢
Peace & Richardson's Hand Saws 30¢
Simonds: 50¢
Circular Saws 40¢@10¢
Crescent Ground Cross Cut Saws 35¢
One-Man Cross Cuts 40¢@10¢
Gang Mill, Mulay and Drag Saws 50¢
Band Saws 25¢
Back Saws 25¢
Butcher Saws 30¢
Hand Saws 25¢
Hand Saws, Bay State Brand 45¢
Compass, Key Hole, &c. 35¢
Wood Saws 35¢
Springfield Mach. Screw Co.: 40¢@10¢@50¢
Diamond Kitchen Saws 40¢@10¢@50¢
Butcher Saw Blades 35¢@40¢
Wheeler, Madden & Clemson Mill Co.'s Cross Cut Saws 50¢

Hack Saws—

Atkins' Hack Saw Blades A A A 25¢
Diston's: 25¢
Concave Blades 25¢
Keystone 40¢
Hack Saw Frames 30¢
Fitchburg File Works, The Best 30¢
C. E. Jennings & Co.'s 150¢
Hack Saw Frames, Nos. 175, 180 40¢@74¢
Hack Saws, Nos. 175, 180, complete 10¢@74¢
Goodell's Hack Saw Blades 40¢
Griffin's Hack Saw Blades 40¢@10¢
Springfield Mach. Screw Co.: 25¢
Diamond Hack Saw Blades 15¢@10¢
Star Hack Saws and Blades 30¢@10¢
Sterling Hack Saw Blades 30¢@10¢
Sterling Hack Saw Frames 30¢@10¢
Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00 10¢

Scroll—

Barnes' No. 1, 115 25¢
Barnes' Scroll Saw Blades 40¢
Barnes' Velocipede Power Scroll Saw, without boring attachment, \$18; with boring attachment, \$20 20¢
Lester, complete, \$10.00 15¢@10¢
Rogers, complete, \$4.00 15¢@10¢

Scalers, Fish—

Covert's Saddlery Works 60¢@10¢

Scales—

Family, Turnbull's 50¢@50¢@10¢

Counter:

Hatch, Platform, 1/2 oz. to 1 lb. 50¢
Two Platforms, 1/2 oz. to 8 lbs. 10¢
Union Platform, Plain, \$1.75 to \$1.50 10¢
Union Platform, Stpld, \$1.75 to \$1.50 10¢
Chatillon's: 25¢
Eureka 40¢
Favorite 40¢
Crocers' Trip Scales 50¢
Chicago Scale Co.: 50¢
The "Little Detective" 25 lbs 50¢
Union or Family No. 2 60¢
Portable Platform (reduced list) 50¢
Wagon or Stock (reduced list) 25¢@35¢
"The Standard" Portables 50¢
"The Standard" R. R. and Wagon 50¢

Screens, Window and Frames—

Air Line Pattern Screens 60¢@10¢
Flyer Pattern Screens 60¢@10¢
Maine Screen Frames 40¢@10¢
Perfection Screens 60¢@10¢@10¢
Phillips' Screen Frames 60¢@5¢@10¢
See also Doors.

Screws—Bench and Hand

Bench, Iron, doz., 1 in., \$2.50 @ 2.75; 1 1/2, \$3.00 @ 3.25; 1 3/4, \$3.50 @ 3.75
Bench, W'd, Beech, doz. 30¢@35¢
Hand, Wood 30¢@35¢
R. Bliss Mfg. Co., Hand 30¢@35¢
Chapin Stephens Co., Hand 30¢@35¢
Ohio Tool Co., Bench and Hand 30¢
Coach, Lag and Hand Rail—Lag, Cone Point, list Oct. 1, '99 75¢@17¢@10¢
Coach, Gimlet Point, list Oct. 1, '99 75¢@12¢@10¢
Hand Rail, list Jan. 1, '81 70¢@10¢@75¢

Jack Screws—

Standard List 75¢@10¢@45¢
Millers Falls 50¢@10¢
Millers Falls, Roller 50¢@10¢
P. S. & W. 50¢
Sargent 70¢@10¢
Swett Iron Works 75¢@10¢@45¢

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron 50¢@50¢@10¢
Flat or Round Head, Brass 50¢@50¢@10¢

Set and Cap—

Set (Iron) 80¢
Set (Steel), net advance over Iron 25¢
Sq. Hd. Cap. 75¢
Hex. Hd. Cap. 75¢
Rd. Hd. Cap. 60¢@10¢
Fillister Hd. Cap. 60¢@10¢@10¢

Wood—

List July 23, 1903:
Flat Head, Iron 87¢@10¢@10¢
Round Head, Iron 85¢@10¢@10¢
Flat Head, Brass 85¢@10¢@10¢
Round Head, Brass 80¢@10¢@10¢
Flat Head, Bronze 77¢@10¢@10¢
Round Head, Bronze 75¢@10¢@10¢
Drive Screws 87¢@10¢@10¢

Scroll Saws—

See Saws, Scroll.
Scythes—Per doz.
Prices announced for next season:
Clipper Pattern, Grass \$6.35
Full Polished, Clipper \$7.00
Grain \$8.25
Clipper, Grain \$8.50
Weed and Bush \$6.50

Seeders, Raisin—

Enterprise 25¢@30¢
Sets—Axl and Tool—
Aiken's Sets, Axl and Tools: 60¢@10¢
Fray's Adj. Tool Handles, Nos. 1, 12; 2, 18; 3, 12; 4, 9; 5, 7 50¢
C. E. Jennings & Co.'s Model Tool 30¢
Hidors 30¢
Millers Falls Adj. Tool Handles, No. 1, 12; No. 4, 12; No. 5, 18 15¢@10¢

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel 10¢ doz sets \$9.00

Sets, Nail—

Octagon gro. \$3.50 @ 3.75
Huck Bros. 27¢
Cannon's Diamond Point, 1/2 doz. \$12.40
Mayhew 1/2 doz. \$9.00
Snell's Corrugated, Cup Pt. 1/2 doz. \$7.20
Snell's Knurled, Cup Pt. 1/2 doz. \$7.20
Springfield Mach. Screw Co.: 1/2 doz. \$7.50
Diamond Knurled Cup Pt. 1/2 doz. \$7.50

Rivet—

Regular list 75¢@75¢@10¢

Saw—

Aiken's: 50¢@10¢
Genuine 50¢@10¢
Imitation 50¢@10¢
Atkin's: 40¢
Criterion 40¢
Adjustable 40¢
Benis & Call Co.'s: 30¢
Cross Cut 30¢
Plate 25¢
Diston's Star and Monarch 25¢
Morrill's No. 1, \$15.00 50¢
Nos. 3 and 4, Cross Cut, \$20.00 50¢
No. 5, Mill, \$30.00 50¢
No. 10, 11, 95, \$15.00 50¢
No. 1, 01 Style, \$10.00 50¢
Special, \$16.25 50¢
Giant Royal Cross Cut 1/2 doz. \$8.00
Royal, Hand 1/2 doz. \$4.50
Taintor Positive 1/2 doz. \$4.75

Shaving

Fox Shaving Sets, No. 30 1/2 doz. net, \$24.00
Smith & Hemenway Co.'s 60¢

Sharpeners, Knife—

Chicago Wheel & Mfg. Co. 70¢
Pike Mfg. Co.: 70¢
Fast Cut Pocket Knife Hones, 1/2 doz. \$1.50
Mounted Kitchen Sand Stone, 1/2 doz. \$1.50
Natural Grit Carving Knife Hones, 1/2 doz. \$3.00
Quick Cut Emery Carving Knife Hones, 1/2 doz. \$1.50
Quick Edge Pocket Knife Hones, 1/2 doz. \$2.50

Skate—

Smith & Hemenway Co. 20¢

Shaves, Spoke—

Iron doz. \$1.10 @ 1.25
Wood doz. \$1.75 @ 2.25
Bailey's (Stanley R. & L. Co.) 45¢
Razor Edge (Stanley R. & L. Co.) 35¢
Chapin-Stephens Co. 30¢@30¢@10¢
Goodell's 1/2 doz. \$9.00 15¢@10¢
Wood's P1 and P2 50¢

Shears—

Cast Iron 7 8 9 in.
Best \$16.00 18.00 20.00 gro.
Good \$13.00 15.00 17.00 gro.
Cheap \$5.00 6.00 7.00 gro.

Straight Trimmers, &c.—

Best quality Jap. 70¢@70¢@10¢
Best quality, Nickel 60¢@60¢@10¢
Fair quality, Jap. 80¢@80¢@5¢
Fair quality, Nickel 75¢@75¢@10¢
Tailors' Shears 40¢@10¢
Acme Cast Shears 40¢@40¢
Heinisch's Tailor's Shears 10¢
Wilkinson's Sheep, 1900 list 50¢@10¢

Tinners' Snips—

Steel Blades 20¢@5¢@20¢@10¢
Steel Laid Blades 40¢@10¢@50¢
Forged Handles, Steel Blades, Berlin 50¢@50¢
Heinisch's Snips 50¢@50¢
Jennings & Griffin Mfg. Co.'s 6 1/2 to 10 in. 50¢
Niagara Snips 40¢
P. S. & W. Forged Handles 20¢

Pruning Shears—

Cronk's Hand Shears 33¢
Cronk's Wood Handle Shears 33¢
Diston's Combined Pruning Hook and Saw, 1/2 doz. \$18.00 25¢
Diston's Pruning Hook, 1/2 doz. \$12.00 25¢
John T. Henry Mfg. Co.: 50¢@10¢
Pruning Shears, all grades 50¢@10¢
P. S. & W. Co. 33¢
Wilkinson's Hedge, 1900 list 50¢
Wilkinson's Lawn and Border 50¢

Sheaves—Sliding Door—

Stowell's Anti-Friction 50¢
Patent Roller, Hatfield's, Sargent's 70¢@10¢
Reading 40¢
R. & E. list 33¢
Wrightsville Hatfield Pattern 80¢

Sliding Shutter—

Reading list 40¢
R. & E. list 33¢
Sargent's list 10¢@10¢

Shells—Shells, Empty—

Brass Shells, Empty: 65¢@10¢
Climax, Club, Rival, 10 and 12 gauge 65¢@10¢
Paper Shells, Empty: 65¢@10¢
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge 25¢@10¢
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20¢@5¢
Climax, Union, League, New Rival, 10 and 12 gauge 25¢@5¢
Climax, Union, League, New Rival, 14, 16 and 20 gauge 20¢@5¢
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge 33¢@5¢
Robin Hood, Low Brass 20¢@10¢
Robin Hood, High Brass 30¢@10¢

Shells, Loaded—

Loaded with Black Powder 40¢
Loaded with Smokeless Powder, medium grade 40¢@5¢
Loaded with Smokeless Powder, high grade 40¢@10¢
Robin Hood Smokeless Powder: 50¢
Robin Hood, Low Brass 50¢@10¢
Comets, High Brass 50¢@10¢

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh: per keg \$4.00
Iron per keg \$3.75
Steel per keg \$3.75
Burden's, all sizes 1/2 keg \$3.90

Shot—

Drop, up to B, 25-lb; bag \$1.70
Drop, B and larger \$1.95
Buck, 25-lb, bag \$1.95
Chilled, 25-lb, bag \$1.95

Shovels and Spades—

Association List, Nov. 15, 1902 40¢

Sieves and Sifters—

Hunter's Imitation gro. \$10.50 @ 11.00
Hunter's Genuine per gro. \$12.00 @ 12.50

Buffalo Metallic Blue, S. S. Co., 1/2 gr.: 14¢@18¢
14¢@18¢ 14¢@20¢
Shaker (Barber's Pat.) Flour Sifters, 1/2 doz. \$2.00

Sieves, Seamless Metallic

Mesh 14 16 18 20
Iron Wire \$1.05 1.05 1.10 1.20
Tinned Wire \$1.15 1.15 1.20 1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 inch.
Mesh 18, Nested doz. \$0.90 @ 0.95
Mesh 20, Nested doz. \$1.00 @ 1.05
Mesh 24, Nested doz. \$1.30 @ 1.40

Sinks, Cast Iron—

Standard list 60¢@60¢@10¢

Barnes' low list 60¢@5¢

NOTE—There is not entire uniformity in lists used by jobbers.

Skins, Wagon—

Cast Iron 80¢@10¢@80¢@10¢@10¢
Steel 40¢@40¢@10¢

Slates, School—

Factory Shipments.
"D" Slates 50¢@50¢@10¢
Eureka, Unexcelled Noiseless 60¢@5¢

Victor A, Noiseless 60¢@5¢

Slow Cutters—See Cutters.

Snaps, Harness—

German 40¢@10¢@10¢

Covert Mfg. Co.: 30¢@2¢

Derby 30¢@2¢

High Grade 30¢@2¢

Jockey 30¢@2¢

Trojan 30¢@2¢

Yankee 30¢@2¢

Yankee Roller 30¢@2¢

Covert's Saddlery Works: 60¢

Crown 60¢

German 60¢

Model 60¢

Triumph 60¢

Oneida Community: 60¢@5¢

Harness Snaps, 1 inch 60¢

Swivel Snaps 60¢

Swivels 50¢

Sargent's Patent Guarded 60¢@5¢

Snaths—

Scythe 50¢

Snips, Tinner's—See Shears.

Spoons and Forks—

Silver Plated—

Good Quality 50¢@10¢@60¢@5¢

Cheap 60¢@60¢@10¢

International Silver Co.: 40¢@10¢

1847 Rogers Bros. and Rogers & Hamilton 40¢@10¢

Rogers & Bro., William Rogers 50¢@10¢

Eagle Brand 50¢@10¢

Anchor Rogers Brand 60¢

Wm. Rogers & Son 60¢@10¢

Miscellaneous

German Silver 60¢@60¢@5¢

Cattaraugus Cutlery Co.: 50¢

Tinned Iron—

Teas per gro. 45¢@50¢

Tables per gro. \$0.50 @ \$1.00

Springs—Door—

Chicago (Coil) 40¢@10¢

Gem (Coil) 20¢

Pullman (Coil) 25¢

Reliance (Coil) 40¢@10¢

Star (Coil) 30¢

Turrey's Rod, 30 lb. \$1.10

Victor (Coil) 50¢@10¢@10¢

Carriage Wagon, &c.—

1 1/2 in. and Wider: Per lb.

Black 40¢@10¢

Half Bright 40¢@10¢

Bright 40¢@10¢

Painted Seat Springs: per pr. 42¢

1 1/2 x 3 x 28 per pr. 70¢

Sprinklers, Lawn—

Enterprise 25¢@30¢

Philadelphia No. 1, 1/2 doz. \$12; No. 2, \$15; No. 3, \$24 30¢

Squares—

Nickel plated. } List Jan. 5, 1900,
Steel and Iron. } 75¢@75¢@10¢

Rosewood Hdl. Try Square and T-Berels 60¢@10¢@10¢

Iron Hdl. Try Squares and T-Berels 40¢@10¢@10¢

Diston's Try Sq. and T-Berels 70¢

For the Table of "Current Metal Prices" see the First Issue of Every Month.